

MIDLINE DIASTEMA: TREATMENT OPTIONS

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ABSTRACT: Maxillary midline diastema is a common esthetic problem in mixed and permanent dentition. The space can occur either as a transient malocclusion or created by developmental, pathological or iatrogenic factors. Many innovative therapies are available from restorative procedures such as composite build-up to surgery (frenectomies) and Orthodontics is available. Treatment depends upon the correct diagnosis of its etiology and early intervention relevant to the specific etiology. Presented herewith case reports which were treated by Orthodontic treatment and also composite build-up.

KEY WORDS: Midline Diastema, Treatment options

INTRODUCTION: A space between adjacent teeth is called a “diastema”. Midline diastemata (or diastemas) occur in approximately 98% of 6 year olds, 49% of 11 year olds and 7% of 12–18 year olds.¹ The midline diastema of the teeth is often a normal or developmental occurrence, due to the position of the teeth in their bony crypts, to the eruption path of the cuspids, and to the increase in size of the premaxilla at the time of eruption of the maxillary permanent central incisors². Eruption, migration, and physiological readjustment of the teeth, labial and facial musculature, development into the beauty-conscious teenage group, the anterior component of the force of occlusion, and the increase in the size of the jaws with accompanying increase in tonicity of the facial musculature all tend to influence closure of the midline dental space. Since the frenum is considered a problem only if the teeth are separated, the effect of these natural forces is not only to close the midline dental space, but also automatically to eliminate the problem of the frenum. Relatively early in orthodontic literature, the superior labial frenum was listed as a cause of the midline diastema. Frenectomy was advised, and techniques for its removal were described. The number of frenectomies currently recommended by orthodontists is relatively small. Most of the respondents are treating the midline dental space Orthodontically without frenectomy. Often, people have a diastema treated for cosmetic reasons. They may be self-conscious about having a space between their teeth. However, a diastema also can affect speech. In cosmetic treatment, the direct-bonding restoration technique re - presents the preferred therapeutic option. It preserves maximal tooth structure and helps to

REVIEW ARTICLE

restore function and aesthetics in only a few clinical visits. In addition, the technique is economical and the possible need for sophisticated indirect restoration can be postponed. Direct-bonding restorations demand excellent clinical skills. The clinician is required to incorporate various clinical techniques, tips and tricks.

CAUSES

- **Genetic:** midline spacing has a racial and familial background.
- **Physiological:** midline diastema may be considered normal for many children during the eruption of the permanent maxillary central incisors. When the incisors first erupt, they may be separated by bone and the crowns incline distally because of crowding of the roots. With the eruption of lateral incisors and permanent canines, midline diastema reduces or even closes (ugly duckly stage)
- **Supernumerary teeth:** The presence of supernumerary teeth and their effect on the developing occlusion has been investigated by numerous authors, but high proportion (38%) of patients with supernumerary teeth had delayed or failed eruption of permanent teeth, whereas inverted supernumeraries were more likely to be associated with bodily displacement of the permanent incisors, median diastema and torsion.
- **Abnormal frenum:** A maxillary midline diastema is often complicated by the insertion of the labial frenum into the notch in the alveolar bone, so that a band of heavy fibrous tissue lies between the central incisors³. A simple test, blanching test was performed for an abnormal high frenum by observing the location of alveolar attachment when intermittent pressure was exerted on the frenum. If a heavy band of tissue with a broad, fan like base is attached to the palatine papillae and produces the blanching of the papilla.
- **Tooth material - arch length discrepancy:** condition such as missing teeth, microdontia, peg shaped laterals, macrognathia. If the lateral incisors are small or absent, the extra space can allow the incisor teeth to move apart and create a diastema⁴.
- **Habits:** Habits such as thumb sucking or tongue thrusting can cause proclination of teeth, which causes midline diastema along with generalized spacing.
- **Midline pathology:** soft tissue and hard tissue pathologies such as cysts, tumors and odontomes may cause midline diastema.
- **Iatrogenic:** rapid maxillary expansion can cause midline diastema due to opening of the intermaxillary suture.
- Moyers stated that imperfect fusion at the midline of premaxilla is the most common cause of maxillary midline diastema. The normal radiographic image of the suture is a V-shaped structure (Fig 1).

LABORATORY ANALYSIS: A functional analysis would need to be done in the diagnostic wax-up, and eventually the provisional prototypes, to make sure that the new restorations would be compatible with habitual movements such as those that occur in mastication⁵ and speech.⁶ The steepness of the interarch relationship in the area of the cuspids (along with the type of food) determines to a large degree the path of closure during mastication.^{7,8}

The completed laboratory analysis via the diagnostic equilibration and wax-up provide a great deal of information:

REVIEW ARTICLE

- The number of restorative units needed to optimally eliminate the patient's dental midline diastema .
- The wax-up illustrated how the individual restorations would appear dimensionally and whether an occlusal/ functional scheme could be worked out that would provide proper force management for longevity of the restorations.
- The wax-up would serve as the prototype design for the direct fabrication of the provisional restorations so that laboratory approximations could be adjusted and verified in vivo

TREATMENT OPTIONS: Before the practitioner can determine the optimal treatment, he or she must consider the contributing factors. These include normal growth and development, toothsize discrepancies, excessive incisor vertical overlap of different causes, mesiodistal and labiolingual incisor angulation, generalized spacing and pathological conditions.⁹ A carefully developed differential diagnosis allows the practitioner to choose the most effective orthodontic and/or restorative treatment. Diastemas based on tooth-size discrepancy are most amenable to restorative and prosthetic solutions.⁹ The most appropriate treatment often requires orthodontically closing the midline diastema.

Treatment of diastema varies and it requires correct diagnosis of its etiology, and early intervention relevant to the specific etiology. Correct diagnoses include radiological and clinical examinations and possibly tooth size evaluation.

- No treatment is usually done, if the diastema is physiological/transient as it spontaneously closes after the eruption of permanent maxillary canines. Spontaneous correction of a childhood diastema is most likely when its width is not more than 2mm.
- Pathological causes like supernumerary teeth, midline soft tissue anomalies can be removed surgically and spaces are closed orthodontically. Oral habits such as thumb sucking and tongue thrusting should be corrected before closure of the space.

ORTHODONTIC APPROACH: It is an error to surgically remove the frenum at an early age and then delay orthodontic treatment in the hope that the diastema will close spontaneously. If the frenum is removed, while there is still a space between the central incisors, scar tissue forms between the teeth as healing progresses, and a long delay may result in a space that is more difficult to close than it was previously.

It is better to align the teeth before frenectomy. Sliding them together along an arch wire is usually better than using a closing loop, because loop with any vertical height will touch and irritate the frenum.

If the diastema is small, it is usually possible to bring the central incisors completely together before surgery.

If the space is large and frenal attachment is thick, it may not possible to completely close the space before surgical intervention. The space should be closed at least partially and the orthodontic movement to bring the teeth together should be resumed immediately after the frenectomy, so that the teeth are brought together quickly after the procedure. When this is done, healing occurs with the teeth together and the inevitable post-surgical scar tissue stabilizes the teeth instead of creating obstacles to final closure of the space¹⁰. (Fig 2, Fig 3)

REVIEW ARTICLE

RETENTION AFTER TREATMENT: permanent retention is required (Fig 4). According to Mulligan, if anterior tooth roots are placed divergent, then there is no need of retention.

ESTHETIC APPROACH: patient demand for aesthetic dentistry with minimally invasive procedures has resulted in the extensive utilization of freehand bonding of composite resin to anterior teeth.

Dental patients are more conscious of their appearances and have raised the importance of the smile within society as a whole; this impacts full mouth restoration as well as more conservative restorative procedures that include class IV restorations, veneers and diastema closure.

The diastema presents itself to the dental office on a regular basis. It may be small or large. The papilla may be long and skinny or blunted. The size will have an effect on what material will be chosen to achieve the desired results. When dealing with a large space closure, orthodontist may be indicated to allow for a more esthetic outcome.

When the teeth are in proper orthodontic alignment, no preparation of the tooth structure is necessary. If there is an alignment problem, minor tooth preparation will be necessary to achieve proper arch form.

Composite resin is an ideal material when restoring diastema closure. It is highly polishable, long lasting and mimics natural tooth structure. It is a conservative alternative to an indirect restoration. (Fig 5)

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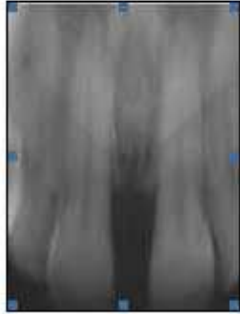


Fig 1

Fig 1. Pathological V-shaped intermaxillary suture.



Fig 2

Fig 2: Case treated by using Begg's technique : Pre-treatment photographs.



Fig 2(A)

Fig 2(A): Case treated by using Begg's technique : Post-treatment photographs intermaxillary suture.



Fig 3

Fig 3: Case treated by using PAE technique : Pre-treatment photographs.



Fig 3(A)

Fig 3(A): Case treated by using PAE technique : Post-treatment photographs.



Fig 4

Fig (4). Permanent Bonded retainer.



Fig 5

Fig 5(B): Aesthetic approach : Case treated with direct restorative material : Pre-treatment photograph.



Fig 5(A)

Fig 5(A): Aesthetic approach : Case treated with direct restorative material : Pre-treatment photograph.

AN ANALYSIS OF SKIN APPENDAGEAL TUMORS IN SOUTH INDIA.

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ABSTRACT: BACK GROUND: Cutaneous appendageal tumours are a large diverse group of tumours that are commonly classified according to their state of appendageal differentiation- eccrine, apocrine, follicular and sebaceous. **MATERIALS AND METHODS:** This is a retrospective study that reviewed the clinical records of patients from the Department of pathology, Govt Kilpauk medical college who were diagnosed with skin tumours by histopathology for a period of three years. Afterwards, these cases were reviewed diagnoses were recorded and classified and analysed according to the patient's age, gender, and localization, occupation, exposure to sunlight and clinical presentation. **RESULTS:** This descriptive study was an analysis of 29 adnexal tumors with regard to age, clinical presentation, occupation and its correlation with histologic diagnosis. Benign tumors were common and composed of 74% and malignant tumors were 26%. . Mean age of presentation of adnexal tumors in this study was 35.2 years with female predominance. 15 of these tumours were derived from eccrine and apocrine glands, 11 of them showed follicular differentiation, and 3 of them showed sebaceous differentiation. They showed a maximum occurrence in face as nodular and papular lesions. Commonest lesion was Trichoepithelioma. **CONCLUSION:** Adnexal skin tumors have distinct histological patterns which differentiates them from other cutaneous tumors. Clinical diagnosis of adnexal tumors is extremely difficult because various adnexal tumors have similar clinical presentation and histopathological examination becomes essential in diagnosis

KEY WORDS: Appendageal, apocrine glands, eccrine, follicular differentiation.

INTRODUCTION: Cutaneous appendageal tumours are a large diverse group of tumours that are commonly classified according to their state of appendageal differentiation- eccrine, apocrine, follicular and sebaceous^{1,2,3}. These tumours generally behave in a benign manner, but malignant types exist.⁴ Their detailed morphological classification is difficult because of the variety of tissue elements and patterns seen. In our present study we have done a histopathologic analysis and clinicopathologic correlation of cutaneous adnexal tumors.

MATERIAL AND METHODS: We have reviewed the clinical records of patients from the Department of pathology, Govt Kilpauk medical college who were diagnosed with skin tumours by histopathology for a period of three years. This is a cross sectional descriptive study of appendageal tumors in department of Pathology. All biopsies were taken from grossly characteristic areas. Multiple biopsies were advised when lesions present in differing forms and

stages. Biopsies received in 10% neutral buffered formalin, processed in routine manner and stained with Hematoxylin and eosin stains. Special stains like PAS and VanGieson were done when needed. An analysis of skin adnexal tumors, their age, site and clinical presentation was done and correlated with histologic diagnosis, and occupational sunlight exposure.

RESULTS: The study was analysis of 29 adnexal tumors. 27 of them are benign and 2 are malignant. 15 of these tumours were derived from eccrine and apocrine glands, 11 of them showed follicular differentiation, and 3 of them showed sebaceous differentiation. As given in Table 1, Male: female ratio is 1:1.6 with female predominance. Mean age of presentation of adnexal tumors in this study is 35.2 years. 52% of adnexal tumors show eccrine and apocrine differentiation and 48% of them show pilosebaceous differentiation. Commonest adnexal tumor in this study is Trichoepithelioma. Appendageal tumours present mostly as single lesions. They show a maximum occurrence in face as nodular and papular lesions. Tumours of follicular differentiation are multiple papular lesions more often seen in face. The malignant Appendageal tumours are two in number with follicular differentiation.

All these tumors did not show any occupational exposure to excessive sunlight.

DISCUSSION: Cutaneous appendageal tumours are a large diverse group of tumours that are commonly classified according to their state of appendageal differentiation- eccrine, apocrine, follicular and sebaceous. These tumours generally behave in a benign manner, but malignant types exist. 29 appendageal tumours were observed in the study. Of which 15 were sweat gland tumours, 3 were sebaceous gland tumours and 11 showed follicular differentiations.

(I)SWEAT GLAND TUMOURS HIDROCYSTOMA: One case of hidrocystoma in the study showed single cystic cavity with two layers of small cuboidal cells. It presented as solitary bluish cystic nodule in neck region. Bluish colour is due to presence of lipofuscin, melanin, hemosiderin and Tyndall effect.

CHONDROID SYRINGOMA: Mixed tumor of skin is the term introduced by Hirsch and Helwig in 1961⁵ has been replaced by the term Chondroid Syringoma. 2 cases observed in the study were firm intradermal nodules seen in face. Hirsch.P.⁵ observed the chondroid syringomas to occur more commonly in head and neck. Similar observations were observed in the study. Histologically, tubular lamina with two layers of epithelial cells in a chondroid matrix is noted. (Figure 1)

NODULAR HIDRADENOMA: 5 cases of nodular Hidradenoma observed in the present study were intradermal nodular lesions in head and neck region presenting in the age group of 30-40 years.

SPIRADENOMA: One case of Spiradenoma in the present study was a solitary intradermal nodule over the face. The tumor was highly cellular with sharply demarcated lobules containing intertwining cords of epithelial cells, surrounded by capsule of compressed connective tissue. Two types of cells were noted small basophilic cells at the periphery and large pale cells in the center. The much-appreciated histological clue the perivascular spaces also observed in the present study was first described by Van Den oord and Chris De wolf Peters in 1998⁶. It consists of variably sized spaces around one or more central blood vessels bordered at the periphery by

a palisade of tumor cells and lined at both sides by basement membrane. The spaces are empty or filled by pink proteinaceous material.

SYRINGOCYSTADENOMA PAPILLIFERUM: 4 cases of Syringocystadenoma papilliferum observed were commonly found in the scalp and face. Histologically, epidermis showed cystic invaginations lined by keratinizing squamous cells in the upper part and papillary projections lined by two rows of epithelium in the lower part. The stroma was densely cellular with plasma cells. (Figure 2)

ECCRINE POROMA: One case of eccrine poroma observed in the study was seen as firm raised asymptomatic nodule in forearm. Histologically, the tumor grows downward into the dermis as broad anastomosing bands of epithelial cells that are smaller than keratinocytes.

(II)TUMOURS OF SEBACEOUS GLANDS: 4 cases of nevus sebaceous were seen in the scalp,(Figure 3) which is the common site. Histologically tumor showed proliferations of sebaceous glands, papillomatous epidermis and ectopic apocrine glands deep in the dermis.⁷

(III)TUMOURS WITH FOLLICULAR DIFFERENTIATION: Histopathologically 33% of tumours show follicular differentiation, compared to 63.4% by Jayalakshmi et al ⁴.

TRICHOEPITHELIOMA: 6 cases of Trichoepithelioma were observed in the study. All were multiple lesions in the form of skin colored papules mainly if the nose and nasolabial fold. Histologically, all of them showed horn cyst surrounded by basophilic cells showing Trichilemmal keratinisation, except for one case where there was no horn cyst formation. Islands of basophilic cells show peripheral pallisading. Important histopathological differential diagnosis is Basal Cell Carcinoma and was differentiated by the absence of retraction artifact of stroma. Papillary mesenchymal bodies, amyloid deposits, mitosis and inflammatory granuloma are other features that distinguish trichoepithelioma from Basal cell Carcinoma.

PILOMATRICOMA (SYNONYM: CALCIFYING EPITHELIOMA OF MALHERBE): Pilomatricoma are benign tumours with differentiation towards hair matrix.⁸ 3 case of Pilomatricoma observed in the study were found in face and upper extremities occurring more commonly in the age group of less than 20 years. Histologically, the tumor is composed of irregular shaped islands of two types of epithelial cells (basophilic cells and shadow cells) with calcification and foreign body reaction. Malignant transformation in Pilomatricoma was not observed in the present study.

One case of Proliferating trichilemmal tumour with malignant transformation observed in the study was seen in scalp as an elevated lobular mass with ulcerations. Histologically, the tumor was composed of multiple lobules of squamous epithelium with peripheral pallisading. The tumor showed extensive areas of trichilemmal keratinisation, tissue invasion and presence of severe atypia and giant nuclei.

TRICHOBLASTIC CARCINOMA: One case of Trichoblastic carcinoma was observed in the present study. Histologically, it was made of proliferation of hair germ cells in the form of islands of basaloid cells with peripheral pallisading, occupying the dermis and infiltration into

ORIGINAL ARTICLE

subcutaneous fat⁹. They showed moderate degree of cytological atypia. It was differentiated from basal cell carcinoma by lack of clefting artifact, stromal edema and ulceration¹⁰.

CONCLUSION: Adnexal skin tumors have distinct histological patterns which differentiates them from other cutaneous tumors. They are commonly distributed in the head, neck and trunk. The commonest are benign variants from eccrine sweat gland origin and the malignant tumors are uncommon. Clinical diagnosis of adnexal tumors is extremely difficult because various adnexal tumors have similar clinical presentation and histopathological examination becomes essential in diagnosis. Since most of adnexal tumors are benign excision is curative.

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TABLES

Table 1: Analysis of 29 adnexal tumors

Benign	74%
Malignant	26%
Male: female ratio	1:1.6
Mean age	35.2 years
Eccrine and apocrine differentiation	52%
Pilosebaceous differentiation	48%
Commonest adnexal tumor	Trichoepithelioma

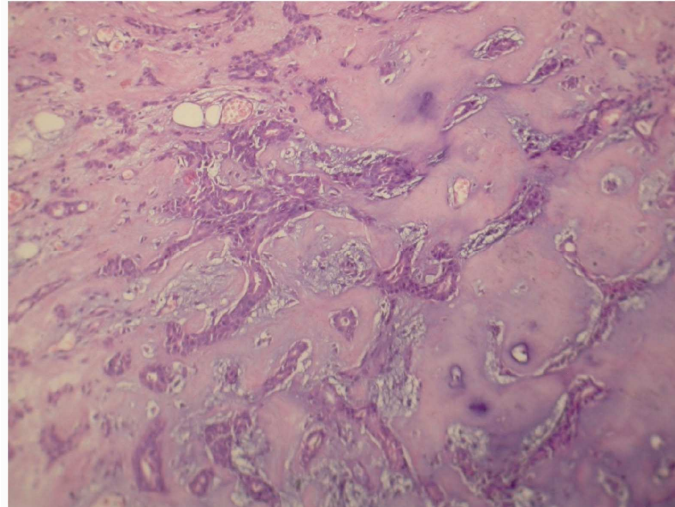


Figure1: Chondroid syringoma Cords of tumor cells in cartilage

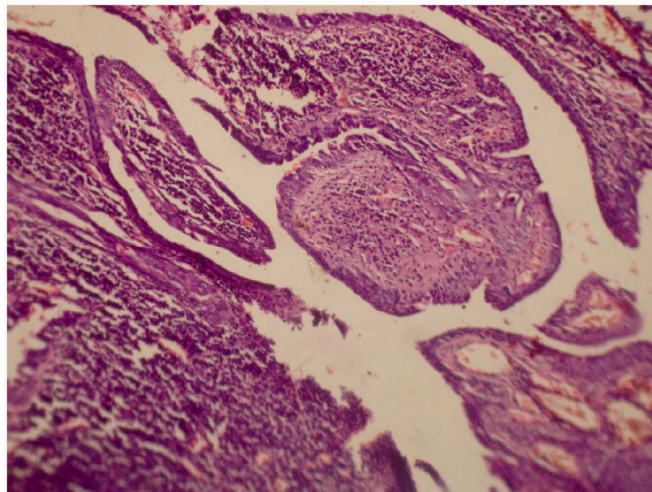
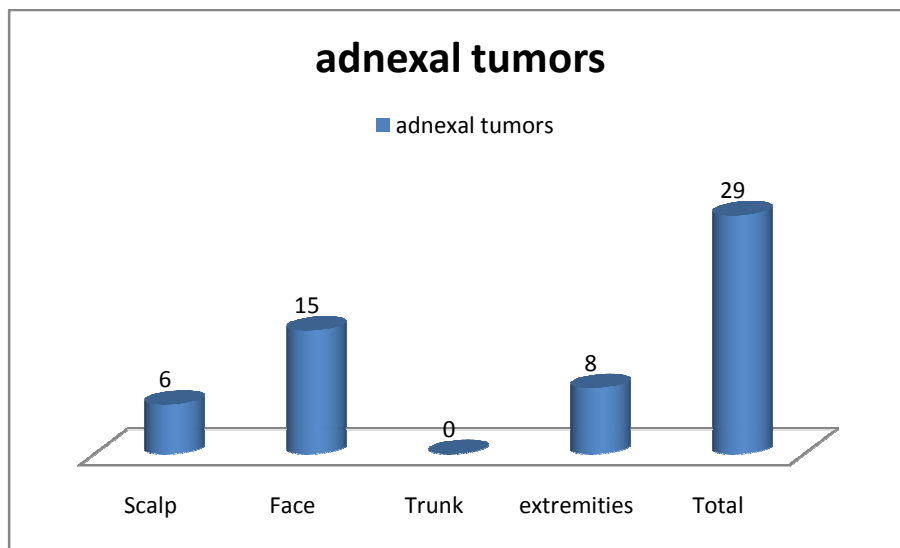


Figure 2: Syringocystadenoma Papilliferum - Papillae lined by two layers of epithelial cells.



Figure 3: Nevus sebaceous A. Clinical picture, B. H & E stain 10X.Lobules of sebaceous glands and hair follicles

Graph 1: Site distribution of adnexal tumors



CASE REPORT

SUBCUTANEOUS ABSCESS CAUSED BY NOCARDIA ASTEROIDES IN A PATIENT WITH PULMONARY TUBERCULOSIS: CASE REPORT AND REVIEW OF THE LITERATURE

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ABSTRACT: Nocardia spp. are aerobic, filamentous Gram positive bacilli causing different infections, predominantly in the immunocompromised host. Infection is produced by different species like *N. asteroides*, *N. brasiliensis* and *N. otitidiscaviarum*. Different predisposing factors have been reported, like corticosteroid therapy, Diabetes mellitus, and HIV infection.

METHODS: We here report a case of subcutaneous abscess due to *Nocardia asteroides* in a patient with previous history of pulmonary tuberculosis and antitubercular drug intake.

RESULTS AND CONCLUSION: *Nocardia* spp. should be suspected in patients receiving antitubercular chemotherapy.

KEYWORDS: Subcutaneous abscess, antitubercular, *Nocardia asteroides*.

INTRODUCTION: *Nocardia* spp. are aerobic actinomycetes causing various infections, predominantly in the immunocompromised host. Infection is produced by different species, of which *N. asteroides*, *N. brasiliensis* and *N. otitidiscaviarum* are most important. Different predisposing factors have been studied, like corticosteroid therapy, Diabetes mellitus, and HIV infection. We here report a case of subcutaneous abscess due to *Nocardia asteroides* in a patient with previous history of pulmonary tuberculosis and antileprotic drug intake.

CASE REPORT: N, a 28-year old male patient, presented in the department of chest medicine of the institute on 21.05.11 with the chief complaints of chest pain and breathlessness. He did not have any history of Diabetes mellitus or hypertension but admitted to smoking one packet of cigarette per day since the past 5 years on inquiry. A chest roentgenogram was performed, which showed left-sided minimal pleural effusion with lung parenchymal collapse. A sputum sample was obtained from the patient and sent for microbiological investigation to the Department of Microbiology. Acid fast stain of the sputum sample with 20% H₂SO₄ showed long, thin, filamentous acid-fast bacilli. The patient was administered antitubercular drugs for 8

CASE REPORT

months. A follow-up X-ray examination of the chest after 2 months showed resolution of the pleural effusion. After 5 months, he developed insidious pain and swelling over his left flank. The patient was again referred to the institute and an aspirate from his left flank lesion was sent to the Department of microbiology. The aspirate was frankly purulent. An acid fast stain with 20% H₂SO₄ showed no acid fast bacilli. However when the staining was carried out with 1% sulphuric acid, thin, beaded, filamentous acid fast bacilli with branching were observed microscopically. Gram staining of the sample showed gram positive, thin, branching, filamentous bacilli. The sample was inoculated on 5% sheep blood agar, Lowenstein Jensen agar slant, MacConkey agar and Sabouraud's dextrose agar. After 48 hours of aerobic incubation at 37° C, small (2-3 mm), light yellow, rough, friable colonies grew on blood agar and L-J slant but not on MacConkey agar. Gram staining of the colonies showed gram positive, filamentous bacilli. Acid fast, filamentous, branching bacilli were observed on acid fast staining of the colonies with 1% sulphuric acid as decolouriser. Few colonies were emulsified in Normal saline in a sterile test tube containing a few sterile glass beads and Citrate utilisation and urease tests were performed and antibiotic susceptibility of the isolate was carried out on Mueller-Hinton agar by the Kirby-Bauer disc diffusion technique. After incubation for 48 hours, the isolate was found to be citrate non-utilising and urease negative. It was susceptible to gentamicin, cotrimoxazole, amikacin and tobramycin and resistant to ciprofloxacin, amoxicillin-clavulanic acid and erythromycin. The isolate also failed to utilise casein, xanthine and tyrosine. Based on these findings, it was presumptively identified as *Nocardia asteroides*.

DISCUSSION: *Nocardia* spp. are aerobic, gram positive, filamentous branching bacilli causing superficial and deep seated opportunistic infections. They are ubiquitously found soil saprophytes comprising about 20 to 30 different species, of which *N. asteroides*, *N. brasiliensis*, *N. farcinica* and *N. otitidiscaviarum* are commonly encountered (1,2). The pathogen was discovered by Edmond Nocard in 1888, and hence the generic name was conferred (3). The first human case was described by Eppinger in 1890 (3). The nocardiae contain tuberculostearic acids but are different from the mycobacteria in possessing shorter -chained mycolic acids (2). Infection is facilitated by factors like the microorganism's ability to inhibit phagolysosomal fusion and enzymes like superoxide dismutase and catalase (4). *Nocardia asteroides* is predominantly implicated in deep-seated infections whereas *N. brasiliensis* has mainly been isolated from superficial infections (5). Nocardiosis most commonly presents as pulmonary disease and lesions in other sites are usually secondary (4). Infection is acquired in most cases through inhalation or direct skin inoculation (6). According to reports worldwide, the most common predisposing factor for nocardiosis is chronic lung disease (4). Other predisposing conditions include HIV infection, Diabetes mellitus, transplantation, haematological malignancies and COPD with steroid therapy. However, about 10% patients with nocardiosis have no identifiable predisposing factor (4). Positive Acid fast stain (Kinyoun's modification) and a positive urease test from culture clinch the diagnosis (5). A definitive identification up to the species level may be achieved by a battery of phenotypic tests, and different schemes have been proposed in this regard. *Nocardia asteroides sensu stricto* Type VI, the commonest species isolated from clinical samples in the United States (4) can be identified on the basis of negative utilisation of casein, xanthine and tyrosine, negative utilisation of citrate, positive growth at 42°C, in-vitro resistance to ciprofloxacin, erythromycin, and amoxicillin-clavulanic acid and susceptibility to gentamicin, amikacin, cotrimoxazole and tobramycin (3). There are a few reports in the literature of isolation of *N. asteroides* from subcutaneous lesions, although this entity is

CASE REPORT

rarely reported⁽⁷⁾. Cutaneous involvement is usually seen with disseminated infection but may also occur as primary cutaneous nocardiosis ⁽¹⁾. There are several reports of superficial nocardiosis from India. Devi and others have documented a case of subcutaneous infection due to *N. asteroides* in a renal transplant patient ⁽⁸⁾. According to other Indian reports, primary cutaneous nocardiosis is mainly caused by *N. brasiliensis* ⁽⁵⁾. One report mentions cervicofacial nocardiosis in a HIV-infected patient ⁽³⁾. The patient in our study was put on antitubercular chemotherapy since the past 10 months. It has been shown that both Isoniazid and Rifampicin, which are antitubercular drugs, can produce adverse effects like agranulocytosis and resultant suppression of the cell mediated immune system, by mechanisms like hypersensitivity or idiosyncrasy ^(9,10). It is possible that the patient developed subcutaneous abscess by *Nocardia asteroides* due to this immunosuppression. This case highlights the fact that antitubercular drugs can produce immunosuppression per se and *Nocardia* spp. should be looked for carefully while investigating subcutaneous abscesses in this group of patients.

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“UROPATHOGENS”: PREVALENCE AND ANTIBIOGRAM OF GRAM NEGATIVE BACILLI WITH SPECIAL REFERENCE TO EXTENDED SPECTRUM BETA LACTAMASE PRODUCTION

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ABSTRACT: This study was performed on culture and sensitivity of 6,951 urine samples, received in the Department of Microbiology, Christian Medical College & Hospital, Ludhiana from out patients and in patients having urinary tract infection (UTI). A total of 2,276 samples were found out to be culture positive, out of which 1,727 samples yielded gram negative organisms. Various isolates included 1,237 *Escherichia coli* (*E. coli*), 262 *Klebsiella pneumoniae*, 47 *Acinetobacter lwoffii*, 39 *Proteus mirabilis*, 39 *Enterobacter aerogenes* and 03 *Pseudomonas aeruginosa*. Extended spectrum beta lactamase (ESBL) production was studied in multidrug resistant *E. coli*. And *Klebsiella pneumoniae*, out of which 28.29% *E. coli* and 30.53% *Klebsiella pneumoniae* yielded positive results. Our results suggest that the physician should be aware of high prevalence of ESBL producing *E. coli* and *Klebsiella pneumoniae* which are the two common uropathogens, and should plan their therapy regime accordingly.

However, *Acinetobacter* species were mainly associated with nosocomial UTI whereas *Enterobacter* species were isolated mostly from out patients. Various uropathogens causing community acquired as well as nosocomial UTI showed poor response to cephalexin whereas resistant strains from both types of UTI exhibited good susceptibility to piperacillin/tazobactam combination.

KEY WORDS: Pyelonephritis, Urinary tract infection (UTI), *Escherichia coli* (*E. coli*), *Klebsiella pneumoniae*.

INTRODUCTION: Urinary Tract Infection (UTI) is defined as microbial invasion of the genitourinary tract. Normally kidneys, ureters, urinary bladder and proximal urethra are sterile, but distal urethra may carry bacteria derived from the faecal flora¹. Most uropathogens gain access to the urinary tract via an ascending route but the continuous unidirectional flow of urine helps to minimize urinary tract infection². UTI is divided into two broad categories i.e. lower UTI and upper UTI. Lower UTI is due to ascending infection caused by faecal coliforms and it includes urethritis, cystitis and prostatitis. Upper UTI means pyelitis (infection of the pelvis of kidney) and pyelonephritis (infection of the parenchyma of kidney). Pyelonephritis is generally caused by haematogenous spread. Females are more frequently affected by UTI

because of short length of urethra and its proximity to anus. In males over 60 years of age, UTI due to enlarged prostate is relatively common. Some predisposing factors for UTI include pregnancy, urethral strictures / stones, prostatic hypertrophy, neurogenic bladder dysfunction following spinal cord injury or multiple sclerosis, reflux of urine from bladder up into ureters and sometimes into the renal pelvis and also some hereditary factors including presence of genetically determined receptors on uroepithelial cells. Many patients may remain asymptomatic. Gram negative bacteria are by far the most common infecting agents in the UTI. Therefore Gram negative uropathogens with their antibiotic susceptibility patterns are reported in the present study.

Current knowledge of the prevalent uropathogens with their antibiotic susceptibility is mandatory for the clinicians to provide appropriate treatment to the patients having UTI³. Broad spectrum beta lactamase producing organisms form a growing worldwide problem⁴. Antimicrobial resistance could happen by enzymatic inactivation, altered receptors or by defective antibiotic transport⁵. Extended spectrum beta lactamases hydrolyse broad spectrum Cephalosporins, which are being used commonly in the treatment of UTI.

MATERIALS AND METHODS: This retrospective study was conducted over a period of one year from 1st July, 2010 to 30th June, 2011 in the Department of Microbiology, Christian Medical College & Hospital, Ludhiana. A total of 6,951 mid stream urine samples were collected from in patients and out patients attending Christian Medical College and Hospital, Ludhiana. In patients were those patients who were admitted in the hospital with a complaint other than UTI but acquired UTI during their hospital stay. Out patients were those patients who were never hospitalised for the last one month and visited the out-patient department with complaint of UTI symptoms.

Taking all sterile precautions, these samples were inoculated on blood agar and MacConkey's agar using semi-quantitative method of inoculation. The culture plates were incubated at 37°C for 24 hours to 48 hours. After plating each urine sample was centrifuged at 3000 revolutions per minute for 3-5 minutes and the deposit was subjected to microscopy to look for the presence of pus cells, red blood cells, epithelial cells and bacteria. Isolates were identified by standard methods⁶. All the gram negative isolates were subjected to antibiotic sensitivity test by Kirby Bauer method⁷ using various antibiotic discs from Hi Media namely Cephalexin (30 ug), Nalidixic acid (30ug), Amikacin (30ug), Ceftriaxone (30ug), Ciprofloxacin (5ug), Norfloxacin (10ug) and combined Piperacillin / Tazobactam (100/10ug).

E.coli and Klebsiella pneumoniae were examined for ESBL production by Double Disc Synergy Test⁸. Ceftazidime (30ug), Cefotaxime (30ug), Ceftriaxone (30ug) and Aztreonam (30ug) discs were placed 25 mm centre to centre away from a 20 ug Amoxicillin/10ug Clavulanate disc. The plate was incubated at 37°C overnight under aerobic conditions and observed for enhancement of the Ceftazidime zone of inhibition near the Amoxycillin-Clavulanic acid disc producing a keyhole appearance.

RESULTS: A total of 6,951 urine samples, which included 3,407 samples from out patients and 3,544 samples from in patients, were tested for bacteriological growth. The number of positive samples were 2,276 (32.74%), out of which 1,727 (75.88%) samples showed Gram negative organisms as indicated in Table 1. Escherichia coli showed 24.75% ESBL production from out and 33.00% from in patients, whereas Klebsiella pneumoniae showed 29.41 % ESBL production from outdoor and 31.46% from in patients. Amongst various uropathogens isolated, E.coli

emerged as the commonest isolate forming 71.63% of the population (1,237/1,727). *Enterobacter* (2.26%) was mainly responsible for community acquired UTI. *Pseudomonas aeruginosa* (5.96%) was mainly associated with hospital acquired UTI. Different isolates exhibited varying sensitivity pattern with nosocomial pathogens showing comparatively higher resistance as depicted in Table 2.

DISCUSSION: Urinary tract infection continues to be one of the most frequently diagnosed conditions in the patients presenting to the primary care practitioner. It is important because of the constantly shifting landscape of drug resistance and antibiotic options⁹. UTI is the third most important common cause of hospital visits in India¹⁰. Most antibiotics are prescribed as empirical therapy before either the identification of pathogen or its antibiotic sensitivity. Although the spectrum of isolates remains constant, their antibiotic sensitivity pattern varies from place to place and even amongst community based and nosocomial isolates over one geographical region. In a study conducted in AIIMS, New Delhi, from July 1998 to June 1999, Mandalet al¹¹ reported *E.coli* to be the commonest urinary pathogen accounting for 45.5% of the community acquired UTI in urban slums of South Delhi. In our study also *E.coli* remains the dominant pathogen with 48.98% isolates in community acquired UTI and 51.02% isolates in hospital acquired infections. *Escherichia coli* and *Klebsiella pneumoniae* constitute the major population of uropathogens.

In the hospitalized patients iatrogenic UTIs following catheterisation constitute a fair proportion with commensals and saprophytes as usual aetiological agents profile of urinary tract isolates. In the present study *Klebsiella pneumoniae* isolates were 45.42% and 54.58% in community related and hospitalized patients respectively. *Acinetobacter lwoffii* was more common in hospital acquired infections, *Enterobacter aerogenes* was found out to be more prevalent as a community based uropathogens and *Proteus mirabilis* is present in almost equivalence in both the kinds of UTI cases. *Pseudomonas aeruginosa* is a common cause of urinary tract infection in hospitals following instrumentation, surgery or catheterization of the urinary tract, often in patients recently treated with antibiotics. Hence it is more common as a nosocomial uropathogen as compared to its prevalence in causing community based UTI. In the present study there were 74.75% *Pseudomonas aeruginosa* isolates associated with hospital acquired UTI.

Extensive use as well as misuse of antibiotics is the primary cause for change in the antimicrobial sensitivity profile of urinary tract isolates. In the present study marked degree of resistance was observed towards Cephalexin and Nalidixic acid. Piperacillin/ Tazobactam combination was found the most efficient agent followed by Amikacin. The community based isolates have exhibited better antimicrobial susceptibility pattern as compared to that shown by the nosocomial pathogens. As such it becomes important for the clinical practitioners to know about the common prevailing urinary pathogens in the hospital as well as in the community along with their likely antimicrobial susceptibility and resistance patterns. In a study conducted by Sader et al¹² Cefotaxime was found to be quite effective against *E.coli* (98.70% susceptibility). In our study also a third generation cephalosporin i.e Ceftriaxone was found to be 92.90% and 85.95% effective towards community based and hospital acquired *E.coli* respectively. Hereby we conclude that hospital acquired pathogens are different and more resistant to various drugs as compared to community based pathogens. These should be treated specifically after antimicrobial testing following culture of urine samples.

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Table 1 Isolated Uropathogens

ORGANISMS Isolates	Total	OUT PATIENTS		IN PATIENTS	
		No. Percentage	(ESBL Producer)	No. Percentage	(ESBL producer)
Escherichia coli	1237	606 48.98	(150)	631 51.01	(200)
Klebsiella pneumoniae	262	119 45.42	(35)	143 54.58	(45)
Pseudomonas aeruginosa	103	26 25.25		77 74.75	

ORIGINAL ARTICLE

Acinetobacter lwoffii	47	06 12.76	41 87.24
Proteus mirabilis	39	17 43.58	22 56.42
Enterobacter aerogenes	39	34 87.17	05 12.83
Total	1727	808 46.78	919 53.22

Table 2 Antibiotic Sensitivity Pattern of Uropathogens in Percentage

ORGANISM ANTIBIOTIC	E.coli	Klebsiella	Pseudomonas	Acinetoba cter	Proteus	Enterobacter
	CA HA	CA HA	CA HA	CA HA	CA HA	CA HA
CEPHALEXIN	22.60 10.11	63.86 50.4	42.31 19.48	66.67 60.98	64.71 54.54	79.41 60
NALIDIXIC ACID	24.25 21.61	73.08 65.03	57.69 20.78	83.33 75.61	82.32 77.18	70.56 60
AMIKACIN	96.36 78.53	89.88 88.81	79.82 37.66	100 100	94.08 81.72	100 85.26
CEFTRIAZONE	92.90 85.95	93.24 90.21	84.61 44.15	83.33 82.93	88.23 86.26	100 85.26
CIPROFLOXAC IN	82.01 63.99	80.64 67.93	46.15 27.31	83.33 75.61	77.18 64.71	100 94.11
NORFLOXACIN	39.11 37.92	85.68 65.17	34.61 31.22	100 97.56	76.44 77.18	100 88.23
PIPERACILLIN & TAZOBACTAM	98.84 92.27	98.28 97.90	96.15 89.71	100 100	100 77.18	100 100

CA—Community Acquired

HA—Hospital Acquired

DETERMINANTS OF SURGICAL SITE INFECTION IN RURAL KANPUR, INDIA

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ABSTRACT: BACKGROUND: Surgical site infection is the second most common nosocomial infection after urinary tract infection and contributes to a significant percentage of morbidity and mortality in patients. **OBJECTIVES:** The objective was to find out SSI rate and determining the factors which are influencing the infection rate. **METHODS:** A total of 150 samples from surgical site were collected and bacterial isolates identified by standard methods. Antibiotic susceptibility testing was performed by Kirby-Bauer disc diffusion method. **RESULTS:** Most common bacteria isolated from surgical site infection was Staphylococcus aureus (31.58%) followed by Klebsiella pneumoniae (26.31%), Pseudomonas aeruginosa (15.79%), E.coli (10.53%), Acinetobacter (10.53%) and Proteus mirabilis (5.26%). Percentage of MRSA, ESBL production in E.coli and Klebsiella pneumoniae were 33.33%, 50% and 60% respectively. All the strains of Staphylococcus aureus were sensitive to Vancomycin. Most of the strains of gram negative bacilli were sensitive to Amikacin. **CONCLUSION:** Surgical site infection prolong the hospital stay, increases the treatment cost, bed occupancy in ward and patient morbidity. Rapid and accurate detection of these pathogens and their antibiotic susceptibility pattern is important for prompt treatment, can prevent the emergence and dissemination of drug resistance. A little modification of determinants can reduce the SSI rate in a hospital to a cost-effective way.

KEYWORDS: Surgical Site infection; Methicillin resistant Staphylococcus aureus; Extended spectrum β -lactamase; Determinants.

INTRODUCTION: One of the major problems faced by the surgeons these days is to deal with surgical site infection as most of them are caused by multi drug resistant bacteria¹.

Despite improvement in operating room practices, instrument sterilization methods, better surgical techniques and the best efforts of infection prevention strategies, surgical site infections remain a major cause of hospital-acquired infections and rates are increasing globally even in hospitals with modern facilities and standard protocols of preoperative preparation and antibiotic prophylaxis. Moreover, in developing countries where resources are limited, even basic life-saving operations, such as appendectomies and caesarean sections, are associated with high infection rates and mortality².

ORIGINAL ARTICLE

The present study was undertaken to find out surgical site infection rate, to determining the antibiotic susceptibility pattern of isolated aerobic bacteria and the factors which are influencing the infection rate.

MATERIALS AND METHODS: A total of 150 samples from surgical site in General Surgery, Obstetric-Gynaecology, Orthopaedic, ENT and Ophthalmology Departments, which were clean, clean-contaminated and suspected of surgical site infection submitted to the Microbiology Laboratory of Rama Medical College, Hospital and Research Centre, Kanpur included in the study.

INCLUSION CRITERIA: Only those swabs from surgical site which were clean, clean contaminated and suspected of surgical site infection were included.

EXCLUSION CRITERIA: Surgical site wounds formed from cases directly related to skin, subcutaneous tissue, abscesses & infected sebaceous cyst, etc. were excluded.

SAMPLE COLLECTION AND TRANSPORTATION: The discharge was collected after taking an informed written consent with two sterile swabs using aseptic precautions before dressing of wounds in the morning. The discharge collected swabs were transported to Microbiology Laboratory within 30 minutes for further processing.

CULTURE METHODS: One swab was used for making a smear & other swab inoculated onto blood agar & mac conkey agar and incubated at 37°C for 24 hours in 7-10 % Co₂ concentration. The isolated organisms were identified by standard microbiological techniques³. All the isolates were tested for antimicrobial susceptibility by Kirby-Bauer disk diffusion method on Mueller-Hinton agar. MRSA and ESBL were detected by CLSI guidelines⁴.

QUALITY CONTROL

1. Staphylococcus aureus ATCC 25923-Oxacillin susceptible.
2. Staphylococcus aureus ATCC 43300-Oxacillin resistant.
3. Klebsiella pneumoniae ATCC 700603- ESBL positive.
4. Escherichia coli ATCC J53RI(TEM ESBL)- ESBL positive.

RESULTS: Among 150 samples, bacteriologically proven surgical site infection was identified in 19 patients. Therefore, the prevalence of culture positive surgical site infection was 12.67 %.

DISCUSSION: Surgical site infection rate as reported by different workers varies from as low as 2.8% to as high as 49.5%^{5,6} (table 9). The high rate of Surgical site infection was reported by some authors^{6,7,10} which may be due to inclusion of all types of wounds. The lower rate of surgical site infection was reported by some authors^{5,12}, may be due to differences in working conditions and hospital setup.

The most common bacteria which causes SSI was Staphylococcus aureus followed by Klebsiella pneumoniae, Pseudomonas aeruginosa, E.coli, Acinetobacter & Proteus mirabilis (Table 1). The organisms which causes SSIs change from place to place and from time to time even in the same place.

ORIGINAL ARTICLE

The incidence of MRSA was 33.33 % (Table-2). All the strains of MRSA were sensitive to vancomycin, which could have relevant clinical use in the antibiotic policy guidelines for hospital. ESBL production was detected in 50 % strains of E.coli & 60% of Klebsiella pneumoniae (Table-3). With the spread of ESBL strains in hospital, co-resistance found to aminoglycosides, fluoroquinolones and tetracycline indicating multidrug resistance pattern. A therapeutic alternative has been recommended to prevent drug resistance among other organisms and hence, there is a need to formulate an antibiotic policy. High degree of resistance was observed against ciprofloxacin, ampicillin, gentamicin & tetracycline but most sensitive drugs were amikacin & Imipenem (Table-2).

It is seen from the above study that most of the bacteria were resistant to commonly used antibiotics due to overuse of antibiotics resulting in selection of resistant strains. It is necessary to know the sensitivity of different bacteria in surgical site infection for two reasons; firstly, to select the appropriate antibiotics to avoid the emergence or overgrowth of resistant bacteria to currently used antimicrobial agents and secondly, these resistant bacteria can cause cross infection to other patients.

Surgical site infection rate is increased in preoperative hospital stay due to severity of illness and comorbid conditions requiring therapy before operation¹⁶. Preoperative hospital stay also promotes acquisition of multidrug resistant hospital strains^{17,18,19}.

In our study, surgical site infection rate was more in emergency operation than elective one, which may be due to sub-optimal preoperative antibiotic prophylaxis, suboptimal preoperative preparation and emergency operations were more likely to be dirty.

Duration of operation explained by decrease resistance due to increase blood loss and surgical trauma due to operative instruments which increase bacterial contamination. The pre-existing illness increase the risk of surgical site infection due to increase in preoperative hospital stay which favour the bacterial colonization and increase the infection rate.

CONCLUSION: Proper infection control measures and a sound antibiotic policy should reduce SSIs in the future. A little modification in these determinants can reduce the SSIs rate in a hospital to a cost-effective way.

CONFLICTING INTERESTS: The authors have no conflicting interests.

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ORIGINAL ARTICLE

Table 1: Aerobic bacteria isolated from surgical site infection

Name of bacteria	No. of isolates	Percentage
Staphylococcus aureus	6	31.58
Klebsiella pneumoniae	5	26.31
Pseudomonas aeruginosa	3	15.79
Escherichia coli	2	10.53
Acinetobacter	2	10.53
Proteus mirabilis	1	5.26
Total	19	100.00

Table 2: Antibiotic susceptibility pattern of isolates

Antibiotics	Disc Conc. µg	S. aureus n.6	K.pneumoniae n.5	P.aeruginosa n.3	E. coli n.2	Acinetobacter n.2	p. mirabilis n.1
Penicillin	10 units	Nil	NT	NT	NT	NT	NT
Gentamicin	10	1(16.67%)	2 (40 %)	2(66.67%)	1(50%)	1(50%)	Nil
Cotrimoxazole	23.75/1.25	2(33.33%)	NT	NT	NT	NT	NT
Tetracycline	30	1(16.67%)	Nil	NT	Nil	NT	Nil
Erythromycin	15	2(33.33%)	NT	NT	NT	NT	NT
Vancomycin	30	6(100%)	NT	NT	NT	NT	NT
Cefoxitin	30	4(66.67%)	NT	NT	NT	NT	NT
Ampicillin	10	NT	Nil	Nil	Nil	Nil	Nil
Amikacin	30	5 (88.33%)	4 (80%)	3 (100%)	2 (100%)	1 (50%)	1 (100%)
Cefotaxime	30	NT	2(40%)	2(66.67%)	1(50%)	1(50%)	1(100%)
Piperacillin-Tazobactam	100/10	NT	NT	2(66.67%)	NT	1(50%)	NT
Ciprofloxacin	5	Nil	Nil	Nil	Nil	Nil	Nil
Polymyxin B	300 Units	NT	NT	2(66.67%)	NT	NT	NT
Imipenem	10	NT	5 (100%)	3 (100%)	2 (100%)	2 (100%)	1 (100%)

Abbreviations:NT-Not tested.

ORIGINAL ARTICLE

Table 3: ESBL production rate in gram negative bacilli of surgical site infection

Name of bacteria	Number of isolates	No. of isolate producing ESBL	Percentage of ESBL
Klebsiella pneumoniae	5	3	60.00
E.coli	2	1	50.00
Total	7	4	57.14

Table 4: Surgical site infection rate in pre-operative hospital stay

Preoperative hospital stay (days)	Total No. of cases	No. of infected cases	Percentage
1 - 7	105	8	7.62
8 - 14	28	6	21.43
15 - 21	11	3	27.27
Above 21	6	2	33.33
Total	150	19	12.67

Table 5: Surgical site infection rate in patients receiving preoperative antibiotic prophylaxis

Preoperative antibiotic therapy	Total No. of cases	No. of infected cases	Percentage
Received	68	4	5.88
Not received	82	15	18.29
Total	150	19	12.67

Table 6: Surgical site infection and nature of surgery

Type of operation	Total No. of cases	No. of infected cases	Percentage
Emergency operations	36	7	19.44
Elective operations	114	12	10.53
Total	150	19	12.67

Table 7: Surgical site infection and duration of operation

Duration of operation	Total No. of cases	No. of infected cases	Percentage
Less than 30 min	19	Nil	Nil
30 min to 1 hour	46	3	6.52
More than 1 hour	85	16	18.82
Total	150	19	12.67

Table 8: Surgical site infection rate in pre-existing illness

Pre-existing illness	Total No. of cases	No. of infected cases	Percentage
Diabetes mellitus	22	5	22.73
Malignancy	20	1	5
Other illness	7	1	14.29
Total	49	7	14.29

Table 9: Surgical site infection rate in different studies

Study	Year	Country	Surgical site infection rate (%)
Olson M et al ⁵	1984	Minneapolis, US	2.80
Agarwal PK et al ⁶	1984	Aligarh, India	49.50
Desa LA et al ⁷	1984	Mumbai, India	18.92
Murthy R et al ⁸	1998	Manipal, India	12.00
Anvikar AR et al ⁹	1999	Aurangabad, India	6.09
Eriksen HM et al ¹⁰	2003	Tanzania	19.40
Lilani SP et al ¹¹	2005	Mumbai, India	8.95
Shojaei H et al ¹²	2006	Iran	4.9
Chattopadhyay R et al ¹³	2006	Canada	5.54
Giri BR et al ¹⁴	2008	Nepal	7.3
Sangrasi AK et al ¹⁵	2008	Pakistan	13.0
Present study	2012	Kanpur, India	12.67

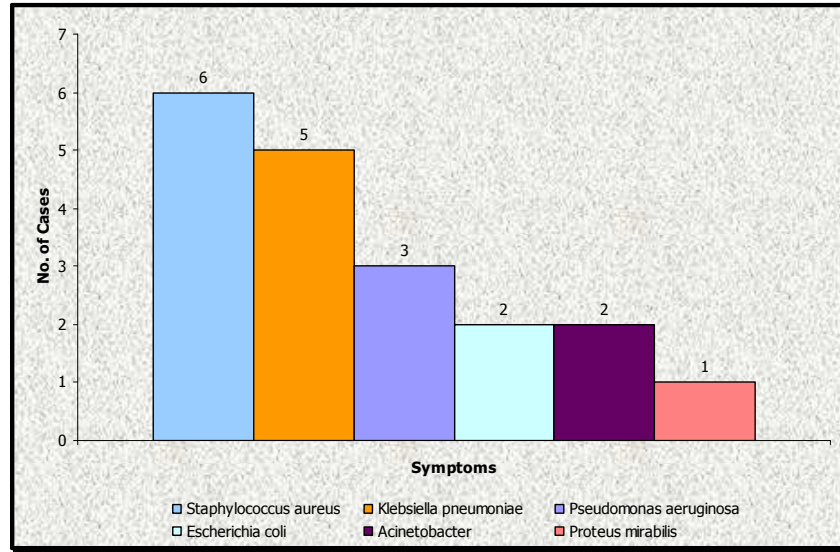


Figure 1: Aerobic bacteria isolated from surgical site infection

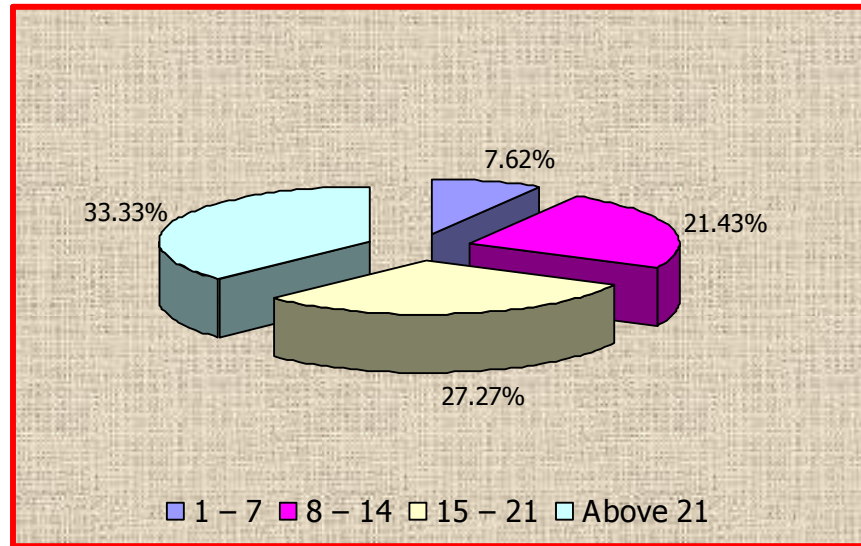


Figure 2: Surgical site infection rate in pre-operative hospital stay

CASE REPORT

RETINAL HAEMORRHAGE IN PLASMODIUM VIVAX PATIENTS- 2 RARE CASE REPORTS

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ABSTRACT: Retinal haemorrhage is commonly detected during ophthalmoscopic examination of patients with Plasmodium falciparum infections. However, it is observed very rarely in Plasmodium vivax infections. Only six cases of retinal haemorrhage have been reported so far in Plasmodium vivax infections. We review the literature and discuss two such cases of retinal haemorrhage that presented at our hospital. It is suggested that retinal haemorrhage be routinely ruled out in all malaria patients, and Plasmodium vivax infection be considered in patients with unexplained retinal haemorrhage and fever.

KEYWORDS: Retinal Haemorrhage, Plasmodium vivax, Plasmodium falciparum, Malarial Retinopathy

CASE REPORT 1: A 23 year old female presented with complaints of fever with chills, malaise since 5 days, and a few episodes of watery, non-blood stained vomiting. There was no history of any bleeding manifestations, joint pain, or breathlessness. She had no significant past history. Clinical examination revealed Fever-100°F, Pulse rate-130/min regular, Blood pressure-110/70 mm Hg, severe pallor, and mild icterus. Systemic examination per abdomen revealed soft, mild hepato-splenomegaly. Routine lab investigations showed Hb-2.4gm%, low Platelet count-20,000/cumm, Total Bilirubin-4.74mg/dl and Serum Creatinine-1.34mg/dl. Peripheral smear showed pancytopenia with microcytic hypochromic anemia and ring forms of trophozoites and schizonts of Plasmodium vivax. Anti-malarial treatment was started and blood transfusion was also done. On the morning of Day 3, the patient suddenly developed blurring of vision. An urgent ophthalmoscopic examination revealed generalized retinal bleeding involving the macular areas in both eyes (Right eye>Left Eye), leading to the loss of vision [Fig 1]. A review ophthalmoscopic examination done 5 days later showed that both eyes had Sub-hyaloid haemorrhages along with Roth's spots.

CASE REPORT 2: A 23 year old male presented with complaints of malaise, fever with chills off and on for 5 days, bleeding per rectum since 3 days, and blurring of vision since 3 days. There was no history of bleeding from any other site or any rashes or joint pain. Clinical examination showed that he was afebrile, Pulse rate-88/min regular, Blood pressure-110/70 mm Hg, severe pallor, icterus, and bilateral pitting pedal edema. Systemic examination showed mild hepato-

CASE REPORT

splenomegaly. Routine lab investigations showed Hb-3.7gm%, low Platelet count - 70,000/cumm, Total Bilirubin-1.41mg/dl, and Serum Creatinine-1.08mg/dl. Peripheral smear showed dimorphic anaemia, leucopenia and ring forms of trophozoites of Plasmodium vivax. Fundoscopy revealed bilateral Roth's spots with Sub-hyaloid haemorrhages [Fig 2]. The patient was treated with anti-malarials and blood transfusion. A repeat ophthalmoscopic examination after 9 days showed resolution of haemorrhages in both the eyes, which was consistent with improved vision in the patient.

DISCUSSION: Retinal haemorrhages are frequently observed in cases of Plasmodium falciparum infections, with its incidence associated with the severity of the Plasmodium falciparum infection [1,2,3]. Malarial retinopathy is seen in adult patients with severe malaria [4], with retinal haemorrhages in 46% cases of cerebral malaria [5] An incidence of 60% is observed in children with cerebral malaria, with lower incidence in less severe forms of malaria [1,6]. A study by Beare et al [7] proposed that detection of malarial retinopathy should tilt the diagnosis in favour of cerebral malaria. Lewallen and others [1] proposed that children with Plasmodium falciparum malaria should be categorized according to their ocular fundus findings, which helps in further diagnostic evaluation.

However, retinal haemorrhage is rarely reported in patients infected with Plasmodium vivax and its exact incidence is not known. The only six cases reported till now have come from India and South Korea, both countries having malaria endemic zones. Both cases in our study also came from endemic zones in Navi Mumbai, India.

Retinal haemorrhages in Plasmodium falciparum patients are due to the sequestration of parasitized RBCs and cytoadhesion with Rosetting, which leads to the haemorrhage [8]. However the mechanism is poorly understood in Plasmodium vivax infections, where sequestration is not seen, although Rosetting has been rarely reported [8,9]. Both cases presented by us had severe anaemia and thrombocytopenia, which could also play a role in the development of retinal haemorrhage in Plasmodium vivax infections.

It has been observed that retinal haemorrhages in malaria patients usually resolve spontaneously but a decrease in visual acuity has been reported in rare cases [10]. This may be because of haemo-toxicity to the photoreceptors, after disruption of tissue oxygenation. To conclude, physicians should routinely conduct ophthalmoscopic examination, even in cases of Plasmodium vivax infection, to rule out retinal haemorrhages. It is also suggested that the possibility of Plasmodium vivax infection be considered in cases of sudden unexplained retinal haemorrhage.

ACKNOWLEDGEMENT: We thank the 'Medicine Department' and the 'Ophthalmology Department' of MGM Medical College and Hospital, Kamothe, Navi Mumbai for their help, valuable discussions and providing photographs.

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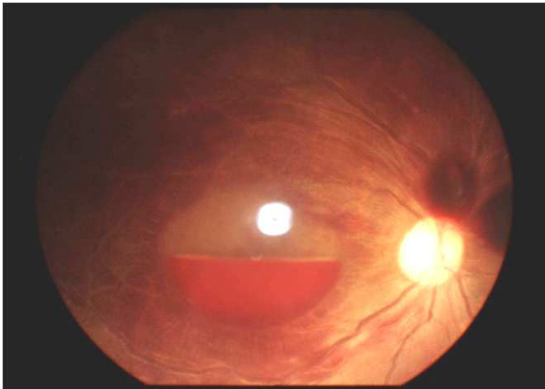


Fig 1 - Shows boat shaped Sub-hyaloid haemorrhages over the macular area (Right Eye).

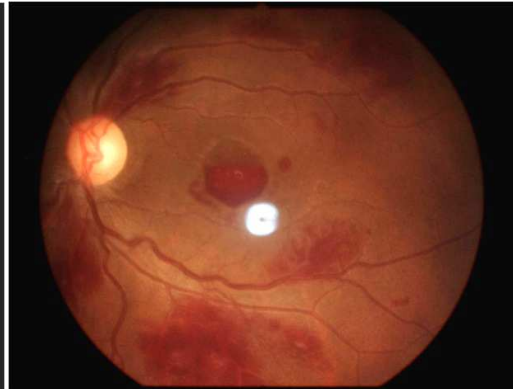


Fig 2 - Shows multiple Roth's spots with Sub-hyaloid haemorrhages in the macular region (Left Eye).

CASE REPORT

BRUGADA TYPE ECG PATTERN IN A CASE OF ALUMINIUM PHOSPHIDE POISONING

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ABSTRACT: We are presenting a case which reveals unmasking of Brugada pattern with aluminum phosphide (celphos) ingestion that could most probably be due to hypomagnesaemia caused by the chemical, though its direct toxic effect on cardiac tissue cannot be ruled out. Earlier low levels of magnesium has been shown to precipitate arrhythmias in susceptible individuals and low magnesium levels have been recorded in survivors of sudden death with underlying Brugada syndrome, this is the first case in which celphos induced hypomagnesaemia has unmasked the Brugada pattern in ECG that can increase susceptibility to life threatening arrhythmias. This case opens scope for further research on role of magnesium in celphos poisoning.

KEY WORDS: Brugada Pattern, celphos, hypomagnesaemia, cardiac tissue, arrhythmias.

A CASE REPORT: A 20 years old male presented in the emergency department one hour after ingestion of two tablets of Celphos. He vomited 5 times before admission and was brought in a state of shock and altered sensorium. He did not complain of chest pain, palpitation or breathlessness. His pulse was 145/min, irregularly irregular with pulse deficit of 15 and poor volume. Systolic blood pressure was 80 mmHg and respiratory rate was 18/min. His systemic examination did not reveal any positive finding except drowsiness. His routine blood investigations were within normal limits except serum magnesium level of 1.0 mmol/l and serum potassium of 2.2 mEq/l. ECG showed typical (type-I phenotype) of Brugada Syndrome with atrial fibrillation (AF) with heart rate of ~145/min. (Fig-1). Gastric lavage was done and patient was given I/V fluids with inotropic support, I/V magnesium & potassium supplements and hydrocortisone. Patient's condition stabilized with treatment and next day serum electrolytes normalized except serum magnesium which still measured 1.2 mmol/l & ECG showed persistence of the same pattern. ECHO showed normal cardiac functions. On day 4, serum magnesium level was 2.0 mmol/l and ECG showed type III Brugada pattern (decreased ST elevation) with regular heart rate of 107/min (Fig--2). ECGs of his mother and brother were normal, however, the provocative tests and genetic testing were declined. Patient had to be discharged on persistent requests.

CASE REPORT

DISCUSSION: Brugada syndrome described by Brugada & Brugada in 1992 is a disease presenting with ST segment elevation in right precordial leads $V_1 - V_3$ (in absence of acute coronary syndrome), right bundle branch block, susceptibility to VT (ventricular tachycardia) and structurally normal heart. It is common in apparently healthy young Southeast Asians with male to female ratio of 8:1. Clinical manifestations include syncope or cardiac arrest because of sudden arrhythmia, the most typical being rapid polymorphic VT that can degenerate into ventricular fibrillation and may culminate into sudden death.

Familial distribution consistent with autosomal dominant inheritance has also been reported with genetic mutations involving SCN5A gene in 20-25% of cases and GPD1-L in ~1% of cases.

The intermittent nature of ECG pattern complicates its diagnosis. 3 types of ECG patterns have been identified, namely type I (coved type ST segment elevation in precordial leads V_1, V_2 and V_3), type II (saddle-back type) and type 3 (right precordial saddle back type ST segment with mirror deviation from the isoelectric segment)¹. Out of these “coved” ST segment elevation or type 1 is presently considered diagnostic for Brugada syndrome.²

Since in the present case there is no history of syncope or arrhythmias, no family h/o sudden death and moreover, no genetic or electrophysiological inducibility study could be done, this patient with type 1 ECG pattern of Brugada may be categorized as having Idiopathic Brugada ECG pattern.³

The underlying cellular mechanism of syndrome involves loss of dome of action potential because of disequilibrium between I_{to} and I_{ca} during phase 1 of action potential in right ventricular epicardium resulting in ST segment elevation.⁴ This heterogenous loss of action potential dome leads to its propagation from sites where it is maintained to sites where it is lost resulting in ventricular arrhythmias.⁵ Interventions increasing potassium current will increase ST segment elevation while interventions increasing calcium current will decrease ST elevation. Magnesium blocks the cellular efflux of potassium through K^+ channels in cardiomyocytes and also acts as a cofactor of NaKATPase.⁶ Thus, hypomagnesaemia which was present in the case at onset could be the cause of unmasking of Brugada pattern and is corroborated by the persistence of pattern till serum magnesium level normalized. Other electrolytes (including potassium) normalized within a day, thus, could not have been the causation factors.

The Brugada pattern was present in the absence of any provocative drugs like Na-channel blockers and class 1_c antiarrhythmics like ajmaline, procainamide or flecainide which are known to unmask the concealed forms of syndrome.²

Other conditions that can simulate this pattern include electrolyte disturbances like hyperkalemia and hypercalcemia⁷ which were ruled out by normal serum calcium and low s. potassium at onset. Hypokalemia which was present at onset is probably not the cause of unmasking of pattern since it causes prolongation of AP duration in contrast to what occurs in Brugada syndrome though it may precipitate arrhythmias in susceptible individuals.

The effect of temperature change on ECG, both hypothermia⁴ (which simulates the pattern by J-point elevation) and fever⁸ (which can precipitate arrhythmia in rare cases of Brugada syndrome) have been ruled out by normal temperature records at presentation and during follow up.

Autonomic nervous system modulation can modify the phenotype because I/V administration of isoproterenol attenuates and that of acetylcholine accentuates the ECG abnormalities in affected individuals.² This patient required inotropic support for one day but

CASE REPORT

the phenotype could not have been affected by that since the pattern persisted even after tapering the drugs.

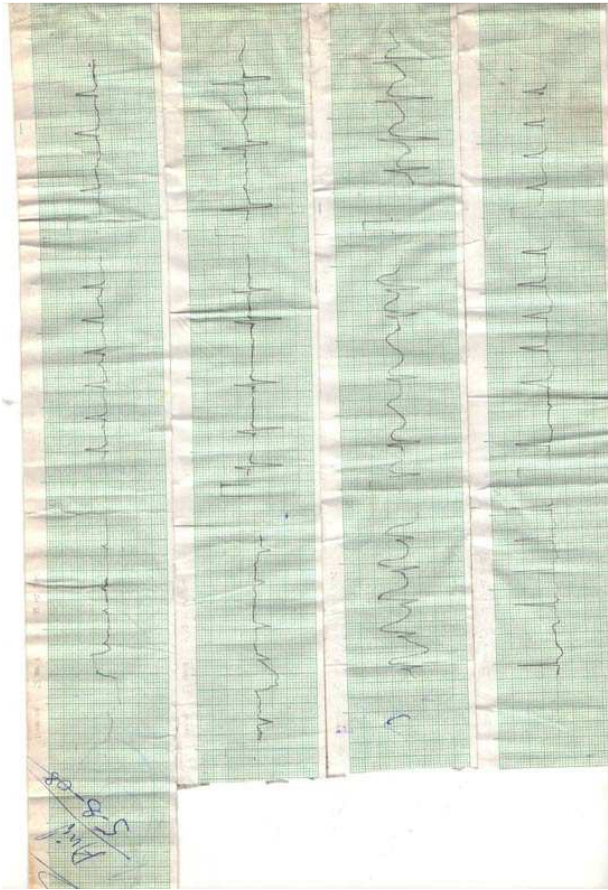
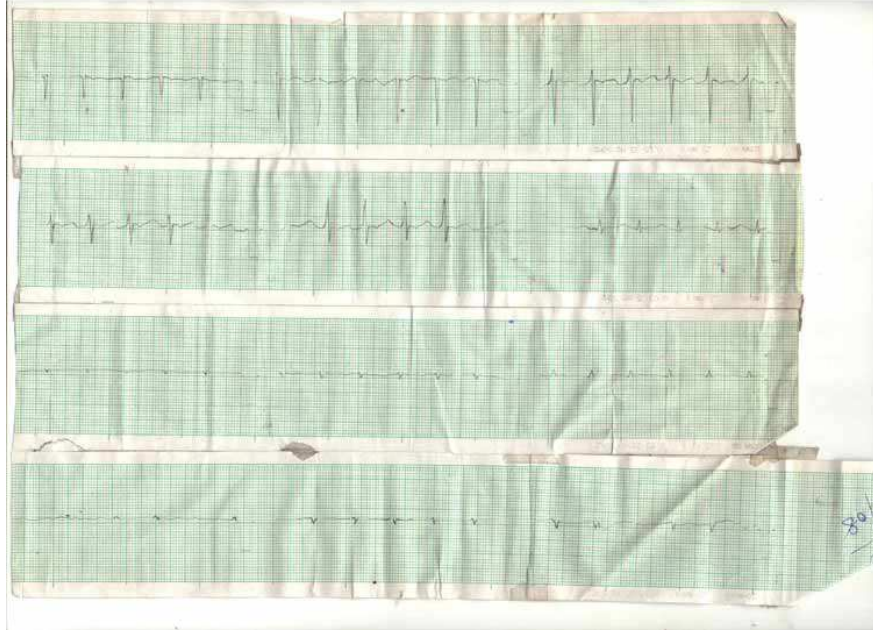
Bradycardia has been known to increase ST segment elevation in the pt with Brugada syndrome and tachycardia to decrease the same.⁹ But this is reverse in our patient since tachycardia (heart rate-136/mt) at presentation was accompanied by Brugada pattern which gradually regressed with stabilization of heart rate.

Various studies on ECG abnormalities in aluminum phosphide poisoning have been conducted earlier but no such Brugada type pattern or unmasking of the phenotype in a patient with Brugada syndrome have ever been recorded. Mathur reported sinus tachycardia in 26.6% cases and complete heart block in 13.33% cases¹⁰. In another study Chugh has reported conduction disturbances, ischemic changes, early repolarisation, varied sinoatrial blocks, bradycardia-tachycardia syndrome and electrical alternans in cases of celphos poisoning. This is probably the first case where the Brugada type pattern has been observed in celphos poisoning.

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CASE REPORT



CASE REPORT

SPINAL ANAESTHESIA FOR TRANS-URETHRAL RESECTION OF BLADDER TUMOR IN A PATIENT WITH RECENT MYOCARDIAL INFARCTION

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ABSTRACT: A 60 year old man with recent Inferior wall Myocardial infarction presented with haematuria and burning micturition after 2 days of admission to our hospital. Urologist was consulted and growth on the left lateral wall of bladder with clots found in the ultra-sound. Transurethral resection of bladder tumor was recommended immediately to control the bleeding and also to stabilize the patient. We know that administering Anaesthesia for a non cardiac surgery who had a recent myocardial infarction poses a higher risk of complications. We present our uneventful experience of spinal Anaesthesia in this patient who had undergone transurethral resection of bleeding bladder tumor successfully.

KEYWORDS: Anaesthesia Techniques-subarachnoid, Heart-myocardial function, Heart-ischemia

INTRODUCTION: Patients with known coronary artery disease exposed to anesthesia for non cardiac surgery have an increased morbidity and mortality when compared to normal population. In particular, administering anaesthesia for one, who had a recent myocardial infarction poses a higher risk of complications. The incidence of perioperative myocardial reinfarction in a patient who had a recent myocardial infarction undergoing non cardiac surgery is very high. [1,2, 3, 4] we present our uneventful experience of spinal Anaesthesia in a 60 year old male for transurethral resection of bleeding bladder tumor who had myocardial infarction just 15 days before the surgery.

CASE REPORT: A 60 year old gentleman who is a chronic smoker and alcoholic presented with the complaints of breathlessness for 5 days. Past history revealed that he is a case of undiagnosed systemic hypertension and coronary artery disease who suffered an Inferior wall Myocardial infarction a week back and thrombolysed with Injection streptokinase at another Institute.

CASE REPORT

On admission to our Institute, his general condition was stable, pulse 88/minute and regular, Blood pressure 100/70mmhg. He looked pale but not cyanosed or icteric. Cardiovascular, respiratory, abdominal, and central nervous system examinations were unremarkable. Basic laboratory investigations were Haemoglobin=6.4 gm%, Random Blood Sugar =101 mgs%, urine albumin and sugar nil. Chest X ray revealed a normal study. Electrocardiogram revealed non significant Q waves in lead III. 2 dimensional Echocardiography revealed regional wall motion abnormality, mild mitral regurgitation, and Ejection fraction 60%. Patient was admitted in the cardiology unit with the following treatment, Tab. Isosorbide mononitrate 20mg BD, Tab. Pantoprazol 40 mg BD Tab. Metoprolol 25 mg BD, Tab. Atorvastatin 40 mg OD, Tab. Aspirin 150 mg OD and was under observation. After 2 days of admission the patient presented with haematuria and burning micturition, for which Urologist opinion was obtained. Ultrasonogram revealed a 5 x 5 cm growth on the left lateral wall of bladder with clots in the bladder. Urologist recommended a cystoscopy with cauterization of bleeding point / transurethral resection of bladder tumor to control the bleeding and to stabilize the patient. Coagulation profile showed Bleeding time as 3 minutes, clotting time 6 minutes 30 seconds and platelet count was 450,000. Prothrombin time and activated partial thromboplastin time were within normal limits.

Two units of packed cells were transfused. Patient was accepted for Anaesthesia under American Society of Anesthesiologists class 3 and informed consent obtained with a plan of Spinal Anaesthesia plus obturator nerve block. Patient was nil per oral from the previous night and Tab. Ranitidine 150 mg + Tab. Metoclopramide 10 mg + Tab. Metoprolol 25 mg were given at 7 A.M. on the day of surgery. Prior to Anaesthesia his vitals were blood pressure 116/80 mmHg, Pulse rate 76/minute and oxygen saturation was 100% on room air. Pre-loading was done with 500 ml of 6% hydroxyl ethyl starch. Inj. Midazolam 1.5 mg was given intra-venously 5 minutes before wheeling the patient to the Operation theatre.

PROCEDURE: Under strict aseptic precautions, spinal anaesthesia was given at L3-4 space, with 2.8 ml which is a combination of a 2.2 ml hyperbaric 0.5% Bupivacaine plus 0.6ml fentanyl . Obturator nerve block was given with 23 G spinal needle after lithotomy position. The sensory level of blockade was up to T8. Intraoperatively 0.5 liter isotonic saline was administered. The patient was haemodynamically stable throughout the procedure which lasted for an hour and five minutes. Patient was shifted to recovery room and one unit of packed cells transfused after that he was transferred to intensive care unit. Lactated Ringers solution was given at 100 ml/hour for four hours, after that oral feeds started. Postoperative analgesia was provided with inj.morphine i.v.8th hourly for 24 hours. 12 lead ECG was taken twice daily for three days to rule out any fresh changes, in addition to the continuous ECG monitoring in intensive care unit. After a week patient was discharged and was doing well for three months of our follow-up.

DISCUSSION: In general, elderly patients have changes in their cardiovascular physiology because of aging and their coexisting diseases which makes them vulnerable to the haemodynamic instability. The anaesthetic management in the patients with the coronary artery disease should be focused on modulation of sympathetic nervous system responses and in controlling hemodynamic variables.^[5] Maintaining the balance between myocardial oxygen requirements and myocardial oxygen delivery is crucial in preventing the myocardial ischemia. Any circumstances associated with tachycardia, systolic hypertension, diastolic hypotension and hypoxemia can unfavorably change this balance. Spinal Anaesthesia is preferred over

CASE REPORT

general Anaesthesia in the elderly patients because of their hemodynamic benefits which includes a minimum decrease in myocardial contractility and a modest decrease in blood pressure and cardiac output. [6,7]

Elective surgery and Anaesthesia following myocardial infarction should be postponed for a certain times. Few studies recommend that the surgery should be postponed until the end of the healing stage of the myocardium which according to them is 3 months. [8,9] It takes about 2 months for most of the infarctions to establish the vascularized scar tissue and one more month to consolidate. [9]

The type of surgery we encountered here is a semi emergency situation as the persistent bleeding from the tumor would eventually lead to severe anaemia which would worsen his already existing anaemic status ultimately affecting his cardiovascular status. So we decided to take him for the surgery and in this case we didn't go for General Anaesthesia, as we know that different inhalational and intravenous agents have different effects on the hemodynamics of the heart such as depression in myocardial contractility, reduction or increase in the heart rate and blood pressure which in our case would be detrimental. We could have opted for continuous epidural analgesia but for the following reasons 1) Shorter duration of the procedure done through the natural orifice.2) Chances for development of haematoma. 3) Starting anti-platelet/anti-coagulant drugs in the post-op period if necessary. We planned to use Low-molecular weight heparin or tissue plasminogen activators with consultation of cardiologist, if the patient developed re-infarct in the peri-op period. We chose spinal Anaesthesia in our patient because it produces satisfactory surgical analgesia, causes minimal hemodynamic changes in this age group, avoids tracheal intubation and maintains spontaneous ventilation. Obturator block was added to avoid adductor contractions which otherwise would cause discomfort to the surgeon. ECG monitoring was done with lead II(for inferior wall) and V₅ (for lateral wall) to detect any changes in ST-T segment during peri-op period. In our patient, hemodynamic stability was maintained throughout the procedure because of addition of intrathecal fentanyl with reduction in local anaesthetic. We used 0.6 ml (30 mcg) of fentanyl with 2.2 ml of hyperbaric 0.5% bupivacaine thus reducing the dose of local anaesthetic which is responsible for the sympathetic blockade and hypotension. It also increases the onset and prolongs the duration of blockade. [10]

CONCLUSION: Semi-Emergency procedures like in our case (Bleeding Bladder Tumor) may be taken up for Anaesthesia and Surgery even in the case of recent M.I. Cardiac and haemodynamic status can be the major factors in determining the Anaesthesia technique and monitoring. Spinal Anaesthesia (preferably local anaesthetic plus fentanyl combination) can be safely administered in this set of patients, provided the cardiac and haemodynamic status are reasonably good, although this may need confirmation by further studies.

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CASE REPORT

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CASE REPORT

LOW GRADE ADENOMYOEPITHELIAL CARCINOMA OF THE BREAST – A CASE REPORT

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ABSTRACT: Adenomyoepithelioma of breast is a rare benign neoplasm characterized by biphasic proliferation of epithelial and myoepithelial cells. (1,2,3,4,10) It occurs in older women and presents as unilateral painless, palpable mass. (1,5,6,10) Mammographic findings are nonspecific. (2) The tumour has a potential for local recurrence (1,3) therefore wide excision is recommended. Histologically these tumours are characterized by epithelial cells in glandular pattern, while myoepithelial cells are spindle to oval cells with clear cytoplasm in sheets. Immunohistochemistry shows positivity of myoepithelial cells for SMA, S100, p63, desmin while epithelial cells show antibodies to cytokeratins. (1,2) Malignant transformation can occur rarely (2,3,5)

KEYWORDS: Breast, adenomyoepithelioma, Low Grade Adenomyoepithelial carcinoma

INTRODUCTION: Adenomyoepithelioma of breast are uncommon tumours characterized by biphasic proliferation of epithelial and myoepithelial cells. (1,2,3) . It was first described by Hampel in 1970 and further classified by Tavassoli in 1991 (3). It usually occurs in older patients, unilateral, painless breast lump being the commonest presentation. (5) All reported cases were female except for two male patients. (1) Although these are benign tumours, local recurrence is reported, therefore wide local excision is the treatment of choice. Rarely malignant transformation can occur in one or both the components (6). Differential diagnosis of this tumour includes sclerosing adenosis, fibroadenoma and tubular adenoma (1)

CASE REPORT: A 80-year-old female patient was admitted with complaints of gradually increasing painless mass in the left breast since last 4 years. Mammography of left breast showed large uniform lump measuring 8 x 8 x 7.1 cm occupying most of the breast. It has well defined margins, no satellite lesions, no speculations, no calcification in the lump. Axillary tail region was normal. Mammography of the right breast was normal.

Local examination revealed firm lump in left breast. The nipple and overlying skin was normal. No axillary lymphadenopathy was noticed.

Routine laboratory test were within normal ranges.

FNAC of the lump was done and was reported as benign breast lesion suggestive of phyllodes tumour. It is true the lesion of Phyllodes tumour is seen in younger group, but on FNAC of this lesion the smears are cellular with both epithelial and more benign stromal

CASE REPORT

fragments , atypia is absent. The possibility of Phyllodes is considered and biopsy is advised for confirmation.

THE PATIENT UNDERWENT LUMPECTOMY: Gross examination showed left simple mastectomy specimen with a gray white mass measuring 9.5 x 5 x 4cm. Cut section showed gray white appearance with cystic areas.

Microscopically the tumour showed biphasic nature composed of epithelial and myoepithelial cells. The epithelial cells are cuboidal to columnar with eosinophilic cytoplasm arranged in tubular pattern while the myoepithelial cells are round to oval with moderate amount of clear cytoplasm arranged in sheets. Mitotic activity is inconspicuous. In areas infiltrative pattern, foci of squamous metaplasia and areas of necrosis are noted. The nipple and areola are unremarkable .

In Differential diagnosis in this case the possibilities of tubular adenoma, sclerosing adenosis and fibroadenoma are ruled out because all these lesions usually occur in younger age group. Again the typical biphasic appearance of epithelial and myoepithelial component which is observed in this case is usually not seen in other lesion. The microscopic features seen in tubular adenoma (closely packed uniform small tubules etc) and in sclerosing adenosis (Nodule with lobular configuration with more cellular centrally than peripherally) is not noted in this case.

Immunohistochemistry showed the positivity for SMA, S100 and p63 in the myoepithelial cells. The mitotic rate was around 6/10 hpf. So the final diagnosis was low grade adenomyoepithelial carcinoma.

DISCUSSION: Myoepithelial cells are normal component of breast tissue.(1,6). However myoepithelial neoplasms are uncommon in breast.(1,3,6,9).Tavassoli classified them into three categories myoepitheliosis, adenomyoepithelioma and myoepithelial carcinoma.(1,3).

Adenomyoepitheilomas show biphasic proliferation of inner epithelial cells and peripheral layer of myoepithelial cells (1).The morphological appearance depends upon the relative amount of epithelial and myoepithelial component.

Adenomyoepitheilomas have been further divided into tubular, spindled or lobulated subtype depending upon their growth pattern (1, 3,9).

Tubular pattern is the commonest pattern (1) showing epithelial cells in tubular or glandular arrangement surrounded by myoepithelial cells with clear cytoplasm. Malignant changes in one or both components have been described (1)

The exact etiology of breast adenomyoepithelioma is not known. All cases are sporadic and no positive family history is noted (1) Kiaer et al described a case with sequential change from adenomyoepithelial adenosis to adenomyoepithelioma which eventually became low grade malignant

adenomyoepithelioma during a course of 18 years.(1,3,6)From these findings Choi et al proposed that adenomyoepitheliomas were derived from long standing myoepithelial breast lesions, such as adenosis and fibroadenoma (1,3)

Immunohistochemical confirmation of histologic diagnosis is always necessary. Immunohistochemistry shows that myoepithelial cells are positive for SMA, S100, p63 and desmin while epithelial cells show antibodies to cytokeratins. (1,,2)

Diiferential diagnosis includes tubular adenoma, sclerosing adenosis and fibroadenoma (1,3)

Tubular adenoma, sclerosing adenosis and fibroadenoma show less proliferative features.

CASE REPORT

Immunohistochemistry for myoepithelial component is must.

The prognosis of these patients is usually good. Wide local excision with adequate margins is the treatment of choice.(6)

Usually these lesions are benign but rarely they can become malignant.

High mitotic rate, cytologic atypia and infiltrative peripheral borders favour malignancy.(5)

Malignant myoepithelial tumours are either pure myoepithelial carcinoma or an adenomyoepithelioma with a component of myoepithelial carcinoma, epithelial carcinoma, sarcoma or carcinosarcoma, (6) Distant metastasis is very rare, in low grade tumours.

CONCLUSION: Adenomyoepithelioma of breast are rare tumours occurring in older female patients, presenting with unilateral mass .Radiological investigations are non contributory. Immunohistochemistry confirmation of histological diagnosis is necessary. Wide local excision with adequate margins is the treatment of choice.

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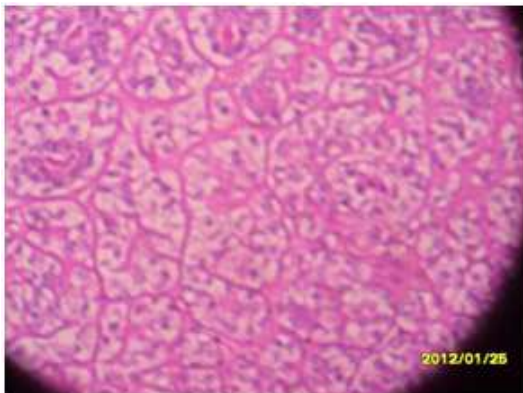
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CASE REPORT

Gross: Lumpectomy Specimen showing cystic areas



High Power View



Low Power view



MULTIDRUG RESISTANT BACTERIA IN A TERTIARY CARE HOSPITAL.

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ABSTRACT: BACKGROUND: Antibiotic resistance is a global problem in the hospitals as well as in the community. Selection pressure exerted by overuse of antimicrobial agents is the commonest predisposing factor of development of resistance. Problems faced are especially with Methicillin Resistant Staphylococcus aureus (MRSA), Vancomycin Resistant Enterococci (VRE) and Multidrug resistant Gram-negative bacilli (MDR-GNB). **AIMS:** A study was undertaken to find out the prevalence of all bacteria isolated in this hospital from different specimens, which are resistant to first line antibiotics and their antimicrobial susceptibility pattern with higher antibiotics during a six-month period. **MATERIAL AND METHODS:** All isolates from different specimens were processed by standard techniques and identified by standard biochemical tests. Antibiotic susceptibility was performed on Mueller Hinton Agar (MHA) by Kirby-Bauer Disc Diffusion Method (KBDDM), according to CLSI guidelines. Those resistant to first line antibiotics were further tested for higher antibiotics. For Extended Spectrum β -lactamase (ESBL) detection, double disc synergy method was carried out for all Gram-negative bacilli. **RESULTS:** Out of 2987 bacteria grown, 904 (30.3%) were multidrug resistant bacteria. Resistance to first line antibiotics was 83.4% and resistance to all higher antibiotics tested was 16.6%. Sixty percent of Staphylococcus aureus was MRSA and all were sensitive to vancomycin. Prevalence of VRE was 5.3%. Carbapenem resistant Pseudomonas aeruginosa and Acinetobacter species were 19.1% and 9.8% respectively and 10.1% of Klebsiella species was carbapenem resistant. **CONCLUSIONS:** This study highlights the extensive problem of antibiotic resistance encountered in this hospital. Thus, prudent and appropriate uses of antibiotics are required to reduce the emergence of resistance. Each hospital should also have its own antibiotic policy based on the susceptibility pattern of bacteria at a particular time, which should be reviewed as and when required. Rational antibiotic use and effective infection control practices can go a long way in preventing the development of antibiotic resistance.

KEY WORDS: Multidrug resistant bacteria; Tertiary care hospital.

INTRODUCTION: Antibiotic resistance is a global problem in the hospitals as well as in the community and is listed at the top of CDC's list of emerging infectious threats to the public health. Selection pressure exerted by overuse of antimicrobial agents is the commonest predisposing factor of development of resistance, which apart from increasing hospital costs, is

also responsible for prolonged illness and treatment failures in these patients.¹ “Relentless and Dizzying rise of antibiotic resistance” has contributed in a large measure to the persistence of infections as a major cause of morbidity and mortality.² Primary mode of transmission of antimicrobial resistance in a hospital is patient to patient spread via hands and equipments of health care workers.

Problems faced are especially with Methicillin Resistant *Staphylococcus aureus* (MRSA), Vancomycin Resistant Enterococci (VRE) and Multidrug resistant Gram-negative bacilli (MDR-GNB) like *Klebsiella pneumoniae*, *Enterobacter* species, *Escherichia coli*, *Pseudomonas aeruginosa* and *Acinetobacter* species.³⁻⁶

Therefore, a study was undertaken to find out the prevalence of all bacteria isolated in this hospital from different specimens, which are resistant to first line antibiotics and their antimicrobial susceptibility pattern with higher antibiotics during a six-month period, i.e. from July to December 2010.

MATERIAL AND METHODS: After approval from Institutional Ethics Committee, all isolates from different specimens were processed by standard techniques and identified by standard biochemical tests.⁷ Antimicrobial susceptibility was performed on Mueller Hinton Agar (MHA) by Kirby-Bauer Disc Diffusion Method (KBDDM), according to CLSI guidelines.⁸ First line antibiotics put up were amikacin (AK), amoxicillin-clavulanic acid (AC), cefuroxime (CU), cefotaxime (CE), ciprofloxacin (CF) and penicillin (P) for Gram-positive cocci and AK, AG, CE, ceftriaxone (CI) and CF for Gram-negative bacilli. Those resistant to first line antibiotics were further tested for higher antibiotics. For all MRSAs, vancomycin (VA), linezolid (LZ) and netilmycin (NT) were further put up. For all enterococci, VA was put up. For all Enterobacteriaceae and *Acinetobacter* species, imipenem (I), NT, cefpirome (Cfp) and cefepime (Cpm) were put, and for *P. aeruginosa* in addition to the above, piperacillin-tazobactam (Pt) was also put up. For Extended Spectrum β -lactamase (ESBL), Double disc synergy method was carried out for all Gram-negative bacilli.⁹ The results were statistically analysed by Proportion method (OpenEPI.com).

RESULTS: Out of total 12,107 samples received during six months, 2987 bacteria were grown (24.7%), of which 904 (30.3%) were multidrug resistant bacteria. Table 1 shows the sample wise distribution of multidrug resistant (MDR) bacteria isolated during the six-month period. Bar Diagram 1 shows the different MDR bacteria (resistant to first line and all the higher antimicrobials tested) isolated during the same period. On statistical analysis by Proportion method, isolation of MDR bacteria was significant from burns swab, blood cultures, stool cultures, anaerobic cultures, urine cultures and endotracheal secretion cultures.

Table 2 shows the predominant Gram-negative bacilli and Gram-positive cocci isolated during the same period. MDR was also significant in *Acinetobacter* species and *Escherichia coli* amongst overall Gram-negative bacilli; and in *Staphylococcus aureus* and *Enterococcus* species amongst overall Gram-positive cocci by Proportion method. Resistance to first line antibiotics was 83.4% and resistance to all higher antibiotics tested was 16.6%. Table 3 shows the distribution of MDR bacteria in different samples.

Sixty percent of *Staphylococcus aureus* was MRSA. Out of 233 MRSA isolated, all were sensitive to vancomycin. Therefore VISA or VRSA was not reported. Of 233, netilmycin sensitivity was seen in 167 MRSAs (71.7%) and 232 were sensitive to linezolid (99.6%). All the MRSAs were resistant to first line antibiotics.

Amongst the 38 enterococci isolated, 36 were sensitive to vancomycin and 2 were resistant. Therefore prevalence of VRE was 5.3%. VRE was isolated from Foley's catheter tips of 2 patients – one was a 13-year male child suffering from Burkitt's lymphoma and the other an adult female having chronic renal failure and pneumonia.

Susceptibility of the common MDR Gram-negative bacilli to higher antibiotics is shown in Bar Diagram 2. Carbapenem resistant *Pseudomonas aeruginosa* and *Acinetobacter* species were 19.1% and 9.8% respectively. Piperacillin-tazobactam sensitivity of *P.aeruginosa* was only 48.1%. While 10.1% of *Klebsiella* species was carbapenem resistant, carbapenem resistance was not seen in *Escherichia coli*, *Enterobacter*, *Citrobacter* and *Proteus* species. One out of 3 *Providencia* species isolated showed carbapenem resistance. Three *Citrobacter* species, 4 *Proteus* species and 3 *Providencia* species isolated were resistant to all the other antibiotics tested.

Only 5 ESBLs were encountered – 3 *Klebsiella pneumoniae* from neonatal blood cultures and 2 *Escherichia coli* – one from adult blood culture and one from stool of an adult male with diarrhea. Out of 5 ESBLs, one was only sensitive to imipenem and other 4 were sensitive to amikacin, but resistant to other antibiotics tested.

DISCUSSION: MRSA appeared in the early 1960s, soon after introduction of penicillinase tolerant penicillins. Clones diversified and nosocomial pathogen spread into the community.³ Methicillin resistance now exceeds 50% in most tertiary care centers.¹⁰ In a study from South India, prevalence of MRSA from clinical samples was 31.1% (250/803) and of all MRSA, MDR was 63.6%.¹¹ In this study, 60% of *S. aureus* was MRSA and almost 50% (233/474) of MRSA isolates were resistant to first line antibiotics. MRSA was significant amongst the total Gram-positive cocci (Table 2). Though VISA is reported from Japan and US, but vancomycin resistance is very low in India. A study from North India has reported 3.3% VISA.¹² However, all the MRSA isolates in the present study were sensitive to vancomycin (100%) and linezolid sensitivity was also good (99.6%). MRSA were most prevalent in pus/wound swabs and in swabs from burn patients – 84.5% (197/233). Nevertheless, hand washing and other standard precautions have to be taken in order to prevent spread of MRSA in hospitals. Screening of health care workers from time to time and decolonization with topical mupirocin in selected cases are must.¹³ Reckless use of this antibiotic may alter the scenario. This coupled with the emergence of Community Acquired MRSA (CA-MRSA) would pose serious clinical problems with global ramifications.¹⁴

MDR *Enterococcus* species was significant amongst the total Gram-positive cocci. Two VRE were isolated in the present study (Table 2). VRE emerged in late 1980s in France and England and subsequently has been isolated all over the world.⁴ They have evolved and diversified in the past two decades. We encountered only 2 VRE in this study, both from Foley's catheter tips. Prolonged hospitalization, severe underlying diseases and/or immunosuppression, stay in intensive care areas, indwelling urinary or central venous catheter, etc. are the risk factors for the development of VRE.⁴ Resistance of enterococci to first line antibiotics was 23.6% (38/161). Only vancomycin sensitivity was 22.4%. Enterococci are always resistant to penicillin and aminoglycosides, leaving us to use no other alternative than vancomycin, overuse of which leads to development of VRE. Karmarkar et al¹⁵ have reported a very high incidence of VRE (53%) of Van B type, while in a previous study in the same institute incidence of VRE was 1%.¹⁶ Thus VRE problem exists, but in a variable manner in hospital environment. Therefore, prudent use of vancomycin and broad spectrum antibiotics should be

done. Hand washing and standard precautions including isolation of colonized or infected patients at one corner of ward or in a separate ward/cabin should be done.¹³

Most tertiary care hospitals are faced with extensive resistance problems in *E. coli* and *Klebsiella* species. Other multiresistant Enterobacteriaceae too establish themselves.^{5,17} *Pseudomonas aeruginosa* was maximum encountered in pus/wound/burn swabs (128/180). *Acinetobacter* species was mostly seen in respiratory specimens (75/218) (Table 2). Isolation of MDR bacteria was significant from burns swab, blood cultures, stool cultures, anaerobic cultures, urine cultures and endotracheal secretion cultures (Table 1).

Escherichia coli and *Acinetobacter* species were significant amongst the total Gram-negative bacilli (Table 2). Amongst Gram-negative bacteria, carbapenem resistance was seen in *Pseudomonas aeruginosa*, *Acinetobacter* species and *Klebsiella* species. Horizontal spread of resistance factors into environmental Gram-negative bacteria has seen the emergence of MDR *Acinetobacter* and *Pseudomonas* species, wherever looked for.^{17,18} Carbapenem resistance of various Gram-negative isolates have been reported from different parts of India.^{5,18,19} In this study, netilmycin sensitivity amongst the common Gram-negative isolates, varied from 8.8% in *Escherichia coli* to 43.9% in *Acinetobacter* species (Bar Diagram 2). Fourth generation cephalosporins also showed high in-vitro resistance against all MDR-GNB (Bar Diagram 2), leaving us to use only imipenem for serious infections, which will lead to more increase in carbapenem resistance in the future.

Increasing resistance of Gram-negative bacilli to 3rd and 4th generation cephalosporins as well as aminoglycosides and quinolones is alarming, which is mainly due to overuse and misuse of these antibiotics.^{6,17} The major risk factors are prolonged stay in ICU, indwelling invasive devices and prior use of cephalosporins and other broad spectrum β -lactam antibiotics. Prudent use of extended spectrum cephalosporins, avoiding prolonged and repetitive use of antibiotics, using antibiotics wisely and treating infection and not contamination are the only means to reduce development of MDR-GNB.¹³ Moreover, vancomycin and linezolid should not be used for prophylaxis and carbapenems should be reserved for serious infections only. We have reported 26% ESBL amongst Gram-negative bacilli in 2006-07. Strikingly ESBL producing bacteria is on the decline since 2008. Only 5 ESBLs has been reported in second half of 2010 in this study, though there are reports from India of ESBL-producing *E. coli* and *Klebsiella* species.⁹

It should also be kept in mind that antibiotics are used as growth promoters, prophylactics and therapeutic agents in veterinary medicine. This adds to the antibiotic selection pressure which has resulted in breeding of multidrug resistant pathogens in hospitals as well as in the community.²⁰ Over-the-counter availability of antibiotics, primitive infection control in hospitals and weak or deficient sanitation are other factors which lead to acquisition of antibiotic resistance. In large parts of the country technical infrastructure is also lacking.²¹ Failure to implement simple infection control practices such as hand washing and changing of gloves before and after contact with each patient are also common causes of infection spread in hospitals.

Thus, prudent and appropriate use of antibiotics is required to reduce emergence of resistance. Newer antimicrobial agents can be developed, but very few are coming up and most of the newer agents are expensive and unaffordable by common people.¹³ Barrier isolation precautions reduce transmission of resistant bacteria among hospitalized patients and control outbreaks, but this is not applicable in the community.

ORIGINAL ARTICLE

CONCLUSIONS: This study highlights the extensive problem of antibiotic resistance encountered in India. It also emphasizes the need for systematic programmes to address the problem and evolve an antibiotic conservation practice.

Active surveillance for MRSA, VRE and MDR-GNB should be done frequently and also contact isolation for all colonized patients should be undertaken.

Each hospital should have its own Hospital Infection Control Committee (HICC) with regular hospital rounds and meetings along with education of professionals and all health care workers from time to time.

Each hospital should also have its own antibiotic policy based on the susceptibility pattern of bacteria at a particular time, which should be reviewed from time to time.

Rational antibiotic use and effective infection control practices can go a long way in preventing development of antimicrobial resistance.

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Table 1. Overall Multidrug Resistant Bacteria (MDR) isolated from different samples during July to December 2010

Sample	Total growth	MDR (%)	'P' value*	Significant(S) /Not Significant (NS)
Pus and wound swabs culture	995	291 (29.2)	0.54	NS
Burns swabs culture	209	141 (67.5)	<0.000001	S
Blood culture	538	106 (19.7)	0.000006	S
Stool culture	99	14 (14.1)	0.0005	S
Cerebrospinal fluid culture	38	11 (28.9)	0.86	NS
Anaerobic culture	143	23 (16.1)	0.0002	S
Urine culture	550	115 (20.9)	0.000008	S
Foley's catheter tips culture	90	33 (44.4)	0.19	NS
Sputum culture	125	51 (40.8)	0.012	NS
Endotracheal secretions culture	174	111 (63.8)	<0.000001	S
Pleural fluid culture	26	08 (30.8)	0.95	NS
Total	2987	904 (30.3)	-	-

*By Proportion Method

ORIGINAL ARTICLE

Table 2. Predominant MDR Gram-negative bacilli and Gram-positive cocci isolated during July to December 2010

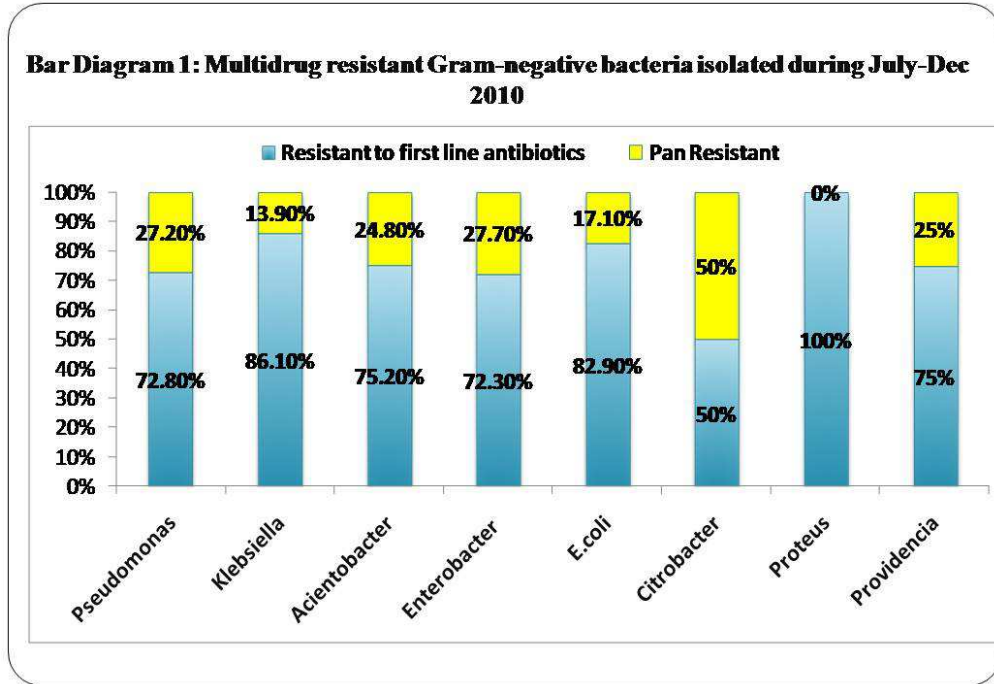
Bacteria	Total growth	MDR	'P' value*	Significant(S) /Not Significant (NS)
<i>Pseudomonas aeruginosa</i>	369	180	0.01	NS
<i>Klebsiella pneumoniae</i>	338	115	0.40	NS
<i>Acinetobacter</i> species	413	218	0.0003	S
<i>Enterobacter</i> species	141	65	0.18	NS
<i>Escherichia coli</i>	389	41	<0.00001	S
<i>Staphylococcus aureus</i>	474	233	<0.00001	S
<i>Enterococcus</i> species	161	38	<0.00001	S

*By Proportion Method

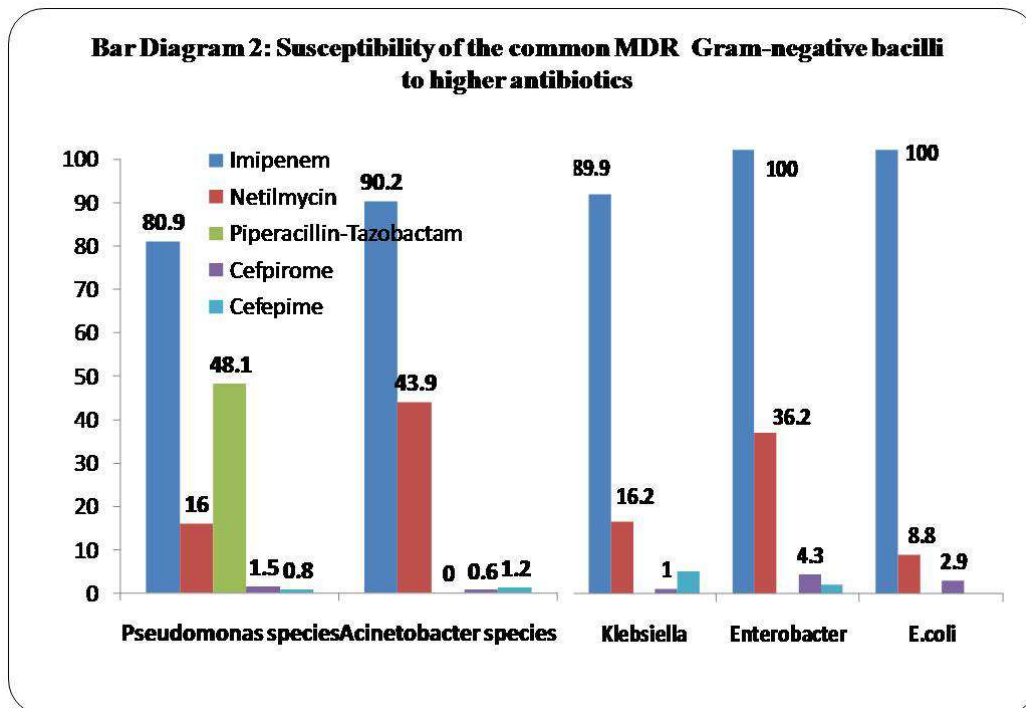
Table 3. Multidrug Resistant Bacteria isolated from different samples during July to December 2010

Organism (Total no.)	Pus & wound swabs	Swabs from burns	Blood cultures	Stool	Urine	Foley's catheter tips	CSF	Anaerobic	Sputum	ET secrns.	Pl. fluid
<i>Pseudomonas aeruginosa</i> (180)	69	59	04	06	11	01	01	03	06	20	00
<i>Klebsiella</i> species (115)	36	00	17	00	26	08	01	03	13	09	02
<i>Acinetobacter</i> species (218)	44	12	43	00	21	08	08	07	21	52	02
<i>Escherichia coli</i> (41)	00	00	02	08	16	09	00	05	00	00	01
<i>Enterobacter</i> species (65)	09	00	10	00	12	03	01	03	05	21	01
<i>Citrobacter</i> species (06)	00	04	00	00	02	00	00	00	00	00	00
<i>Proteus</i> species (04)	00	00	01	00	00	01	00	02	00	00	00
<i>Providencia</i> species (04)	00	02	00	00	00	00	00	00	00	02	00
MRSA (233)	133	64	15	00	05	01	00	00	06	07	02
<i>Enterococci</i> (38)	00	00	14	00	22	02	00	00	00	00	00

CSF: Cerebrospinal fluid; ET secrns.: Endotracheal secretions; Pl. fluid: Pleural fluid.



Bar Diagram 1: Multidrug resistant Gram-negative bacteria isolated during July to December 2010



Bar Diagram 2: Susceptibility of the common MDR Gram-negative bacilli to higher antibiotics

IMAGE REPORT

A RARE CASE OF A MALPOSITIONED CENTRAL VENOUS CATHETER

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ABSTRACT: A Malpositioned Central Venous Catheter is a common but serious complication of central line placement¹⁻². However malpositioning into the contralateral subclavian is extremely unusual. The authors describe a case in which a catheter is inserted via a right sided infraclavicular approach and malpositions itself into the contralateral subclavian vein.

KEYWORDS: Central venous catheter, Subclavian, internal jugular, malpositioning

INTRODUCTION: Malposition of central venous catheter is well known technical complications. Its incidence during Subclavian vein puncture is reported to vary from 1.8%³ to 9.3%⁴ Most commonly, the right subclavian venous catheter gets malpositioned to ipsilateral internal jugular vein³. Malpositioning into the contralateral subclavian vein is highly unusual.

IMAGE REPORT: A 55 year old female with diagnosed to have a squamous cell carcinoma of the left cheek, was posted for a left sided hemi-mandibulectomy and radical neck dissection. A right side subclavian central venous catheter (7 Fr, 16cm, double lumen polyurethane with Blue FlexTip, Arrow, PA, USA) was placed through an infraclavicular route through a standard Seldinger technique and fixed at 14cm to the skin. Adequate blood flow on aspiration and free flow of injected saline confirmed the intravenous positioning. General anaesthesia was induced and the intraoperative course was uneventful. Post operatively a portable check X ray revealed the malpositioning into the the left subclavian vein

(Fig 1). The catheter was removed and a left sided subclavian catheter inserted and position confirmed with a check X ray.

DISCUSSION: Central venous catheterization (CVC) is commonly performed procedure in emergency situations, major operations, intensive care monitoring. The immediate, procedural complication of this procedure include pneumothorax, inadvertent arterial puncture, hematoma, air embolism, perforation of vessel wall, arrhythmias, brachial plexus injury & catheter malposition⁵. The most commonly occurring malposition is into the ipsilateral internal jugular vein (60-70%)⁶. Other common sites include the azygous, left superior intercostal vein and thymic vein⁷. The contralateral subclavian vein is the most unusual site for migration of the CVC.

IMAGE REPORT

In our case, the guidewire inserted in right subclavian vein passed through right brachiocephalic vein, and instead of proceeding towards superior vena cava (SVC), entered into left brachiocephalic to finally position itself into left subclavian vein.

Some authors use formulas based on height to limit the depth of insertion but it has been noted that in such cases the chances of malposition are as high as 48% requiring repositioning⁸. The same study also noted that ECG monitoring when performing the procedure can place the CVC tip in correct position in 92% of cases while monitoring change in configuration of 'p' wave⁸. Some authors have stated that 18 cm is the maximum length to which a guidewire of a central line should be inserted⁹ while others have stated the maximum depth to which a central catheter can be inserted is 16.5cm¹⁰. The advantage of real time ultrasound guided CVC insertion is that it provides visualization of vein and its anatomical variation, improves success rate and decreases the number of venipuncture attempts & complications. It however it does not guide subsequent positioning of catheter tip¹¹. Some authors, however did not find any significant difference in the rate of complications or failures of subclavian venous catheterization performed by less experienced operators¹².

In conclusion, although newer techniques like ultrasound guided placement and endocavitary ECG to guide placement into the superior vena cava, are available today, there is no replacing the time tested, 'confirmatory check X ray' which still remains the easiest method to confirm catheter position. Fluoroscopy too provides a real time alternative to confirming the position of catheters but is not available in Indian most hospital setups for such 'trivial' purposes.

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IMAGE REPORT

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Figure 1: Mal-positioned right subclavian central line into left subclavian vein.

CASE REPORT

NIEMANN PICK DISEASE – A CASE REPORT

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ABSTRACT: Niemann Pick Disease (NPD) is a rare autosomal recessive metabolic disease characterized by lysosomal lipid storage. The disease is caused by deficiency of enzyme, acid sphingomyelinase (ASM) which leads to accumulation of sphingomyelin & other lipids in reticuloendothelial cells of various organs like liver, spleen, bone marrow, lymph node, brain, nerves and kidney. Four types of the disease have been identified which are A, B, C and D. The type C is divided into types C1 and C2, each caused by a different gene mutation.

We report a case of Niemann Pick Disease type B. The patient was a 10 month male child who presented with repeated episodes of vomiting and loose motions. His blood counts revealed pancytopenia. Bone marrow (BM) aspiration was performed which showed many large histiocytes with foamy cytoplasm- Niemann Pick cells which are characteristic of this disease. Further confirmatory investigations were not done because of nonaffordability of parents. At present no definite treatment is available however newer treatment modalities like Bone Marrow transplant, enzyme replacement therapy and gene therapy are likely to be useful especially in NPD type B. However such treatment is unlikely to prevent or reverse the major neurological complications of NPD type A. Supportive treatment through nutrition, medication, physical therapy can help to improve quality of life.

KEYWORDS: Niemann Pick Disease, NPD Type B, bone marrow, liver biopsy, ASM -acid sphingomyelinase.

INTRODUCTION: NPD is due to deficient activity of sphingomyelinase, a lysosomal enzyme encoded by the SMPD1 gene located on chromosome bands 11p15.1-p15.4(1). It results in sphingomyelin accumulation in the reticuloendothelial system (1). It also gets deposited in CNS, lung, liver, spleen etc.

The incidence of type A & B in general population is estimated to be 1 in 250,000 while that of type C is 1 in 150,000. NPD type A is more common in Ashkenazi Jewish population with estimated incidence of 1 in 40,000 (10) & the carrier frequency among this population is 1 in 90 (1). Both sexes are affected equally.(1)

CASE REPORT: The patient was a 10 month male child who presented with repeated episodes of vomiting and loose motions. His blood counts revealed pancytopenia.

Other biochemical investigations are within normal range. Bone marrow (BM) aspiration was performed which showed many large histiocytes with foamy cytoplasm-

CASE REPORT

Niemann Pick cells which are characteristic of this disease. These cells are large histiocytes with central and eccentric nucleus and cytoplasm showing soap bubble appearance. (Fig 1)

Further confirmatory investigations were not done because of nonaffordability of parents.

DISCUSSION: The name Niemann Pick is derived from name of German pediatrician Albert Niemann who first reported a case in 1914 and Ludwig Pick (1927) who provided further clinical and pathological description that helped in differentiating this disease from Gaucher's disease ⁽¹⁾

Niemann Pick Disease is classified into four subtypes ⁽²⁾

Niemann Pick Disease type A: classic infantile

Niemann Pick Disease type B: visceral

Niemann Pick Disease type C: subacute / juvenile

Niemann Pick Disease type D: Nova Scotian

NEIMAN PICK DISEASE TYPE A : It usually presents in first few months of life with abdominal swelling, hepatosplenomegaly, feeding difficulties, loss of early motor skills ,recurrent infections and irritability⁽²⁾ As age advances progressive loss of motor function ,deterioration of intellectual capabilities and in final stage spasticity and rigidity occurs. Blood investigations show pancytopenia.

NEIMAN PICK DISEASE TYPE B: In contrast, NPD type B has variable clinical presentation. Jaundice and hepatosplenomegaly may be detected in early childhood in some patients but may remain barely noticeable in others. In adult life patients may present with pancytopenia & hepatosplenomegaly. Pulmonary involvement may be detected in the form of diffuse reticular or finely nodular lesions. Patients with lung lesions may present with dyspnoea, decreased oxygen saturation and repeated life threatening bronchopneumonia or cor pulmonale. Rarely involvement of retinal neurons (cherry red spots), CNS and skeletal system are noted. These patients are not affected intellectually. The life expectancy of NPD type B patients is highly variable depending on the severity of their symptoms ^(3,4).

NEIMAN PICK DISEASE TYPE C: NPD type C usually affects children of school age but the disease may strike at any age from infancy to adulthood. Symptoms may include jaundice and large spleen or liver, difficulty in upward and downward eye movement (highly suggestive of NPD type C), clumsiness, problems in walking, slurred and irregular speech, learning difficulties and other neurological abnormalities. Life span is usually short depending upon severity of symptoms ⁽³⁾.

NEIMAN PICK DISEASE TYPE D: It involves a defect that interferes with movement of cholesterol between brain cells. It is now considered as variant of type C.

PROGNOSIS: Infants with Type A die in infancy. Type B children live comparatively longer but require supplemental oxygen due to lung impairment.⁽⁴⁾In Type C and Type D some patients die in childhood while others less affected may live upto adulthood.

PREVENTION: Niemann Pick Disease is autosomal recessive disease. Genetic counseling and genetic testing is recommended for families who may be carriers of Niemann –Pick.

CASE REPORT

When both parents are carriers, there is 25 % chance that their child will have the disease and 50 % chance that a child will be carrier.

NPD cases are diagnosed by detection of Niemann Pick cells in aspiration or biopsy of bone marrow, liver and spleen. Diagnosis is confirmed by measuring ASM enzyme activity in peripheral leukocytes, cultured skin fibroblasts, chorionic villi and amniocytes. High performance liquid chromatography (HPLC) using plasma instead of leukocytes is a very reliable and highly sensitive technique to determine ASM activity for accurate diagnosis of NPD patients or carriers⁽²⁾. Diagnosis of both NPC1 and NPC2 mutations is suggested by demonstration of delayed esterification of LDL- derived cholesterol and increased amount of unesterified cholesterol in fibroblasts. Staining with filipin demonstrates the intracellular accumulation of cholesterol. DNA mapping of patient as well as the carrier parents gives the definite diagnosis ^(2,3).

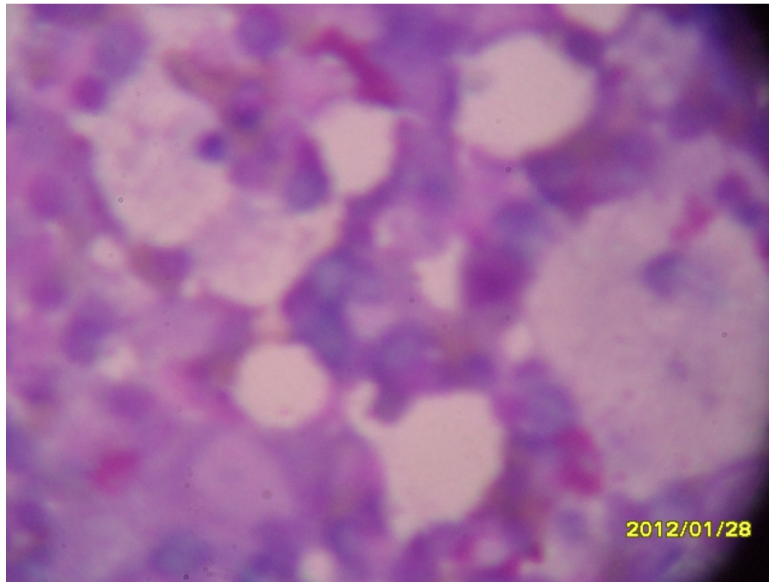
CONCLUSION: The clinical manifestations show marked variability in patients among phenotype B, ranging from severe disease in childhood to milder course till old age. Chronic visceral nonneuropathic type B has good prognosis. Life expectancy of patient can be improved by supportive care through nutrition, medication (like lipid lowering drugs), physiotherapy & specialist care for treatment of complications. Early diagnosis is useful as it allows time to plan for disease management.

At present, as no specific treatment is available, only supportive treatment is offered. Newer modalities like bone marrow transplantation, enzyme replacement therapy and gene therapy are likely to be useful for NPD type B ^(5,6).

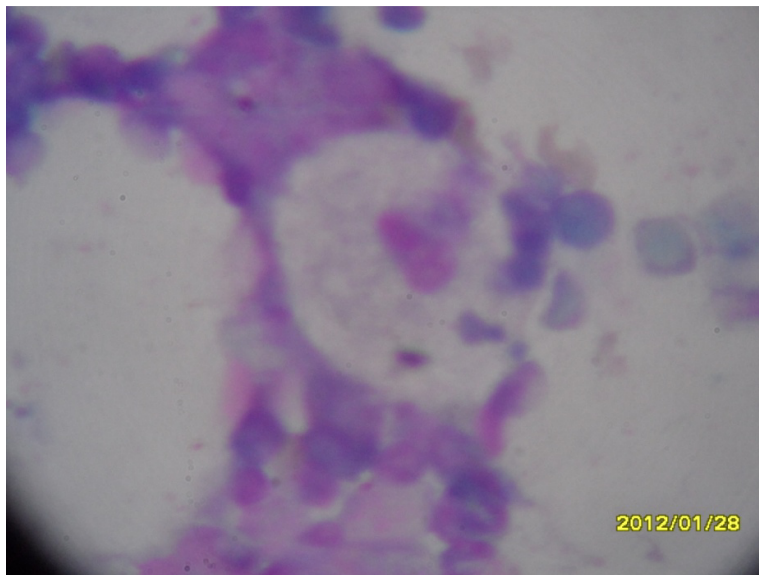
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CASE REPORT



Low power view : Leishmann stain : Neimann Pick Cells .



High Power View : Leishmann Stain : Neimann Pick Cell

SEROPREVALENCE OF HEPATITIS-C VIRUS IN BLOOD DONORS AND HIGH RISK INDIVIDUALS

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ABSTRACT: Hepatitis C virus (HCV) continues to be a major disease burden affecting about 200 million people in world. Using blood donors as a prevalence source may underestimate the real prevalence of the virus because the donors are highly selected population. Presently more evidences support intravenous drug use as leading risk factor for the spread of virus. **OBJECTIVES:** The study aims at finding out the seroprevalence of Hepatitis C virus in high risk individuals as well as healthy blood donors. **SETTINGS AND DESIGN:** The study group comprise of 350 subjects which included 150 healthy voluntary donors as control group and 200 subjects taken from different high risk population like intravenous drug abuser (50), patients on long term haemodialysis (40), patients with chronic liver disease (50), HIV positive cases (30), health care workers (30). **STATISTICAL ANALYSIS USED:** Percentage. **RESULTS:** Seropositivity for anti HCV antibody was found to be 12% (24/200) among high risk population and 0.66 % (1/150) in healthy voluntary blood donors. Among different high risk groups, maximum prevalence rate 28% (14/50) was found in I.V drug abusers. Fifty percent (7/14) of the seropositive parenteral drug abusers were male in the age group of 21-30 years followed by 35.7% (5/14) in 31-40 years of age group. Only one female (7.14%) between 21-30 years was found to be sero-reactive for antiHCV antibody. In HIV co-infected cases 13.33 % (4/30) were seropositive for antiHCV antibody. In chronic liver disease (two hepatocellular carcinoma, one cirrhosis and one chronic hepatitis) and long standing haemodialysis, the prevalence rate for anti HCV was found to be 8% (4/50) and 5% (2/40) respectively. None of the health workers (0/30) found to be sero-reactive for antiHCV antibody. **CONCLUSIONS:** HCV poses a serious worldwide health problem affecting people from all walks of life in every country. In the present study 12% and 0.66% HCV prevalence was noticed in high risk group and healthy blood donors respectively. Among high risk group maximum prevalence (58.33%) was found in IV drug abusers. Prevention should target the reduction of virus transmission by health education, risk reduction counseling and thorough HCV screening following the suggestion of CDC, Atlanta, USA.

KEY WORDS: Hepatitis C virus, Intravenous drug use, Blood transfusion, Liver disease.

ORIGINAL ARTICLE

INTRODUCTION: Hepatitis-C is a global disease. It has been estimated that the global prevalence of Hepatitis-C virus (HCV) infection is around 3.3% with 200 million persons chronically infected with the virus and 3 to 4 million persons newly infected added every year^[1] Where as in 2011, it was found that the global prevalence of HCV was found to be 2.35% affecting 160 million chronically infected individuals^[2]. Hepatitis-C, in combination with hepatitis-B, now accounts for 75% of all cases of liver disease around the world.

HCV can lead to chronic liver disease causing cirrhosis, hepatocellular carcinoma and end stage liver disease among 5-20% of infected persons.^[2] India is estimated to have 168,000-1.1 million IDUs (intravenous drug users) with HCV antibody prevalence ranging from 5 to 93%; among HIV+ IDUs it is as high as 100percent.^[3,4,5,6,7,8]

India's blood banking system has serious shortcomings. Professional blood donation continues to flourish despite stringent law. Improperly sterilized needles are reused for drawing blood or pushing drugs. It has been well documented that the dialysis patients have a higher rate of HCV infection. The rate of seroconversion among haemodialysis patients with no other risk factors has been reported 1.38-1.9%/year.^[9,10]

The present study aims at finding out the seroprevalence of Hepatitis-C virus in high risk individuals as well as healthy blood donors.

MATERIALS AND METHODS: A prospective case control study was carried out in the department of Microbiology, S.C.B. medical college and hospital, Cuttack in collaboration with departments like Gastroenterology, Nephrology, Drug de-addiction cum rehabilitation centre and ICTC (Integrated counseling and testing centre) for a period of 15 months from march 2005 to June 2006.

The study group comprise of 350 subjects which included 150 healthy voluntary blood donors as control groups and 200 subjects taken from different high risk population like IV drug abuser (50), patient on long term haemodialysis (40), with chronic liver disease (50), HIV positive cases (30), Health care workers exposed to HCV positive blood by accidental needle stick injuries or sharp exposure (30). The informed consent was obtained from the patients before collecting the sample.

3.5 ml of venous blood was collected from each patient using disposable needle and syringe in a sterile dry and labelled vial and was allowed to clot. The blood samples were centrifuged at 1000 rpm for 15 minutes and the separated serum was preserved at 4-8° C for one week.

Micro well ELISA was done by using third generation HCV microlisa (J. Mitra and Co. ltd.) for the detection of antibodies to hepatitis C viral antigens such as Core, NS3, NS4 and NS5 in human serum. All the samples and reagents were brought to room temperature (20-30° C) before use.

STATISTICAL ANALYSIS USED: Percentage

RESULTS: Out of 150 healthy voluntary blood donors screened, only 01 (0.66%) male in the age group of 31-40 was found to be positive for antiHCV antibody. (Table-1)

Amongst 200 high risk individuals screened, 24 (12%) were found to be positive for antiHCV antibody. Amongst the positive cases for HCV antibody, the seropositivity in IV drug abusers, patients with chronic liver disease, HIV positive individuals and haemodialysis cases were found to be 58.33% (14/24), 16.66% (4/24), 16.66% (4/24) and 8.33% (2/24) respectively. Health care personnel were negative for antiHCV antibody 0% (Table 2). Seropositivity, among

IV drug users, was seen more in males in the age group of 21-30 (50%) and 31-40 years (35.7%). Only one female in the age group of 31-40 was positive for antiHCV antibody (Table 3). Co-infection of HCV with HIV was found to be 13.33%. Out of which 10% had the history of parenteral drug abuse and the rest with multiple sexual contact. (Table-4)

DISCUSSION: Transfusion of blood and blood products has been a leading cause of transmission of HCV, however due to improved screening, transmission through transfusion decreased in developed countries. The incidence of transfusion related hepatitis C infection dropped from 4.9% to 1.9% in Japan, 3.84% to 0.57% in USA.^[11] However, the highest incidence (54%) of transfusion related HCV infection was found in a study of 147 Chilean patients with chronic hepatitis- C.^[12] In New Delhi and Kolkata, in India, the prevalence of antiHCV antibody in healthy blood donors was 1.85% and 2% respectively.^{[13],[14]} In a previous study in early 2002 at cuttack, the prevalence of antiHCV antibody in healthy voluntary blood donor was 2.12%.^[15] In contrary to this result, in the present study the seroreactivity for HCV was 0.66%(1/150) only. The low prevalence in the present study may be due to mandatory screening for HCV infection introduced in late 2002. In 2010, a study at Kolkata, revealed still lower prevalence 0.35% for HCV antibody.^[16]

Out of the total 200 high risk group 12% (24/200) were ELISA positive for antiHCV Ab. Parenteral drug abusers showed a higher infection rate of 58.33% (14/24) followed by patients with chronic liver disease 16.66% (4/24) and 16.66% (4/24) in HIV co-infected cases. Transmission of Hepatitis C virus has been strongly associated with intravenous and percutaneous drug and needle use. Reported cases of Hepatitis C from intravenous drug use are on the rise in different parts of the globe. Study at Baltimore in Maryland and Antwerp & Limburg in Belgium reported a prevalence of HCV in IV drug abuser is 30.3%, 71% and 46% respectively.^{[17],[18]} A recent study in London England, on 428 IV drug abusers, revealed 44% seroreactivity for HCV antibody compared to 4% for HIV.^[19] Seroprevalence of HCV among IV drug abusers was an alarming 92% and 71.2% at Manipur and Mizoram of India, respectively.^{[20],[21]} In a recent study at Chennai, HCV antibody prevalence was 5.5% (63/1158) among Intravenous drug users(10/15)^[22]. The importance of intravenous drug use cannot be over-emphasized. The prevalence of HCV among people who acquired HIV through intravenous drug use reaches 90%.^[23] Co-infection of the two viruses can make treatment more difficult. In our study co-infection of HCV with HIV is found to be 13.33% (4/30), out of which 10.3% (3/40) had history of parenteral drug abuse and 3.3% (1/30) with history of multiple contact. The seroprevalence of hepatitis C in chronic liver disease in India has ranged from 3-31%.^[24] The studies at Chandigarh and Tamilnadu reported seroreactivity for antiHCV antibody to be 48% and 5.6% respectively.^{[25],[26]} In the present study, the seroreactivity for antiHCV antibody in patients with chronic liver disease was found to be 8%(4/50). Equal number of males and females (two each) had antiHCV antibody. Both the females were diagnosed as hepatocellular carcinoma. A significantly high prevalence of co-infection (HCV and HBV) rate of 24.7% was also reported from Punjab.^[27]

Patients on haemodialysis are at an increased risk for acquiring hepatitis C infection, as a result of cross contamination from the dialysis circuits. In the 90's at many places of the world the prevalence rate of HCV infection in dialysis patients was 10-50%.^{[28], [29], [30]} Previously in Europe the prevalence rate was as high as 20-30%. By 2000, the rate of seroconversion among haemodialysis patients with no other risk factors has been reported 1.38-1.9% /year.^{[31],[32]} In India there is much variation in the prevalence rate of HCV, in dialysis

ORIGINAL ARTICLE

patients varying from 4.3% at Delhi to as high as 13.23% and 46% at Hyderabad.^{[33],[34],[35]} Stringent blood testing and isolation of dialysis machines have helped in reduction of hepatitis C transmission. In present study, 5% (2/40) patients with chronic renal failure on long term haemodialysis were found to be positive for anti HCV antibody.

Health care workers are at a higher risk for acquiring hepatitis infection as they come in contact with potentially infected subjects. Prevalence of hepatitis C among health workers range from 0-4% in this population.^{[36],[37]} In our study none out of 30 health workers, found to be seroreactive for antiHCV antibody.

Hepatitis C is an emerging infection whose long term implications will be felt in the decades to come. In the absence of vaccine, primary prevention of hepatitis C should target reduction of the transmission of the virus.

Prevention should target those at risk of acquiring virus and therefore should involve providing education, risk reduction counseling, substance abuse treatment and HCV screening following the centre of disease control (CDC) guidelines such as screening drug abusers, receiver of blood and its products (clotting factor concentrates) and organs, screening persons with long term dialysis, children of HCV positive women, health care workers and persons with evidence of chronic liver disease.^[27]

ACKNOWLEDGEMENT: I express my heartfelt thanks to Mr. Dilip Barik, for his technical support during this study. I also like to thank with deep sense of appreciation to Mr. Prasanta Kumar Pradhan for his computer assistance in preparing this manuscript.

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Table-1: Seroprevalence of antiHCV Ab in control group

CONTROL GROUP	NUMBER	ELISA +VE	PERCENTAGE (%)
HEALTHY BLOOD DONOR	150	1	0.66%

ORIGINAL ARTICLE

Table-2: Seroprevalence of antiHCV Ab in different high risk group

HIGH RISK GROUP	NUMBER	ELISA+VE	% IN RESPECT OF TOTAL ELISA POSITIVE
IV DRUG ABUSER	50	14	58.33%
HAEMODIALYSIS	40	2	8.33%
CHRONIC LIVER DISEASE	50	4	16.66%
HEALTH CARE PERSONNEL	30	0	0%
HIV+VE CASES	30	4	16.66%
TOTAL	200	24	100%

Table-3: ELISA positive cases of IV drug abusers in relation to age and sex

AGE	MALE	FEMALE	TOTAL M+F	MALE POSITIVE	FEMALE POSITIVE	TOTAL M+F POSITIVE
10-20	6	0	6	1(7.14%)	0	1
21-30	20	3	23	7(50%)	1(7.14%)	8
31-40	17	0	17	5(35.7%)	0	5
41-50	4	0	4	0	0	0
TOTAL	47	3	50	13(92.85%)	1(7.14%)	14

Table-4: Coinfection of HIV and HCV

HIV+VE	NO.	ANTI HCV Ab+VE
WITH H/O PARENTERAL DRUG ABUSE	15	3(10%)
WITH H/O MULTIPLE SEXUAL CONTACT	15	1(3.33%)
TOTAL	30	4(13.33%)

CASE REPORT

NOSOCOMIAL URINARY TRACT INFECTION DUE TO TRICHOSPORON ASAHII: A RARE CASE REPORT

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ABSTRACT: *Trichosporon asahii* is a basidiomycetous yeast which causes white piedra and onychomycosis in immunocompetent hosts. In immunocompromised hosts this species may cause a number of localized and disseminated infections. Urinary tract infection by *Trichosporon asahii* is a rare occurrence. Few cases have been reported from India. We present a microbiologically confirmed urinary tract infection with *T. asahii* in a 52 year old diabetic, female patient who had undergone hysterectomy for dysfunctional uterine bleeding. Her urine sample was subjected to culture and sensitivity for postoperative rigor. Gram stain examination of the centrifuged urine revealed septate hyphae with arthroconidia and pus cells. Yeast like fungus was isolated in pure culture in three consecutive samples which was confirmed as *Trichosporon asahii* by standard tests. The response to antifungal therapy was dramatic. *Trichosporon* species though occasionally a part of normal flora, may be involved in causing nosocomial opportunistic infection more so in immunocompromised hosts. Very few cases of microbiologically confirmed urinary tract infection have been reported so far. Its diagnosis is likely to be missed or misinterpreted because of lack of awareness. Therefore *T. asahii* deserves recognition as a pathogen.

KEY-WORDS: *Trichosporon asahii*, Urinary tract infection

INTRODUCTION: *Trichosporon* is a genus of anamorphic yeasts with distinct morphological characters of budding cells and true mycelium that disarticulates to form arthroconidia.¹ It is present in the external environment and is isolated mainly from the soil, water, air and organic materials.² In the past *T. bigelli* was known to be the sole pathogenic species under *Trichosporon* genus, responsible for superficial infection of skin such as white piedra and infection of nails. Following extensive taxonomic re-evaluation presently seven species are known to be pathogenic for human beings. They include *Trichosporon asahii*, *Trichosporon asteroides*, *Trichosporon cutaneum*, *Trichosporon inkin*, *Trichosporon mucoides*, *Trichosporon ovoides*, and *Trichosporon loubrieri* of which *Trichosporon asahii* causes most of the disseminated infections.³

Disseminated infections are increasingly reported in immunocompromised hosts.³

CASE REPORT

Trichosporonosis manifests as fever, pulmonary infiltrates, azotemia, renal dysfunction and skin lesions. The yeast can be isolated from sputum, urine, skin and blood. Trichosporon species are important cause of sepsis in immature infants, and summer type hypersensitivity pneumonitis (SHP) in Japan.²

CASE PRESENTATION: A fifty two year old female patient was admitted to our Gynaecology ward in August, 2011 for dysfunctional uterine bleeding. As per her previous medical records, she was a known diabetic and hypertensive without any history of tuberculosis or HIV. On USG abdomen and pelvis, multiple myomas were found in the uterus, for which hysterectomy was done. Post operatively patient was with catheter and on intravenous Ceftriaxone and Amikacin. She was responding well to the management until fifth day. On sixth day of surgery, she developed spiky fever associated with chill and rigor. Her blood parameters were as follows: hemoglobin: 9.2 gm/dl, Total leucocyte count 14,200/ μ l, Fasting and postprandial blood sugars were 190 g/dl and 230gm/dl respectively. Her blood Urea and creatinine were 47 mg/dl and 2.2 mg/dl respectively.

The patient's urine sample was sent for routine microscopic examination, aerobic culture and sensitivity testing. Routine microscopic examination of urine showed numerous pus cells. The Gram stain examination of the patient's centrifuged urine sample showed plenty of pus cells and septate hyphae with arthroconidia. The urine sample was inoculated with a standard loop on CLED (Cystine Lactose Electrolyte deficient) agar and incubated overnight at 37 °C. Tiny, creamy - white, dry and wrinkled colonies were seen on CLED agar (Figure 1). The Gram stain of the colony revealed septate hyaline hyphae with arthrospores and few budding yeast cells (figure 2). The colony was subcultured on a set of Sabouraud's Dextrose Agar (SDA) and incubated at 28 °C and 37 °C. At both these temperatures, colonies of yeast like fungus (figure 3) were obtained in pure cultures within 24 hrs. Routine examination of urine and culture on SDA of two more consecutive samples revealed the similar findings as that of the first. The yeast was identified to be *T. asahii* with cornmeal agar morphology (Figure 4), hydrolysis of urea, carbohydrate fermentation - assimilation test and nitrate assimilation test.

Based on the culture report, antifungal therapy with Fluconazole was initiated and the general condition of the patient improved dramatically. Within four days of therapy, other complaints were resolved. After 4 weeks of antifungal treatment, the urine sample was sent for repeat fungal culture and it was found to be negative for fungus.

DISCUSSION: Trichosporonosis is usually an insidious disease but it can present as an opportunistic infection in susceptible hosts. Trichosporon species are occasionally a part of normal flora of human skin.²This yeast has been documented on intact perigenital skin in 12.4 % of population.²Factors that enhance the mucosal colonization and subsequent invasion of the fungus include broad spectrum antibiotic treatment and break in mucosal barrier.⁴ Candida species is well known to cause infection in diabetic patients.⁵ Trichosporon asahii causes white piedra, a superficial infection of hair shaft mainly restricted to tropical regions and onychomycosis in immunocompetent humans.⁶

In the past few decades, a worldwide increase in the incidence of opportunistic fungal infections has been observed.^{7,8}The increase in immunocompromised state has been accompanied by an increase not only in frequency of opportunistic fungal infections but also in the variety of species involved.⁵Among them, deep seated trichosporonosis is a lethal opportunistic infection found in immunocompromised patients, particularly those who are

CASE REPORT

neutropenic due to cytotoxic therapy for hematological malignancies.^{7,8} In immunodeficient host it has been isolated from blood, skin, urine and viscera causing various localized or disseminated deep infections.⁶

UTI due to *Trichosporon asahii* is a rare occurrence. Very few cases of microbiologically confirmed infections have been reported so far.^{3,5} Though reported rarely, *Trichosporon asahii* is a known pathogen to cause UTI. It has been reported to cause UTI in seven month old child following urethral valve surgery from India.⁵ Nosocomial infection due to *trichosporon asahii* has been reported from Chile.⁹

We isolated *T. asahii* from the urine of a fifty two year old, catheterized, postoperative, diabetic lady who had undergone hysterectomy for dysfunctional uterine bleeding.

Isolation of the same yeast in three consecutive urine samples in significant counts and the fact that no bacteria was isolated, establishes *Trichosporon asahii* as an etiological agent of urinary tract infection. Besides this, the clearance of the organism from the urinary tract with recovery of the patient following antifungal treatment strongly associates the yeast as causative agent of UTI.

Our patient exhibited risk factors such as trauma during surgery, presence of indwelling catheter, use of broad spectrum antibiotics and more over she was a known diabetic. It is possible that the organism colonized the catheter from the human flora during catheterization and subsequently causing invasion and UTI.

CONCLUSION: *Trichosporon asahii* is a basidiomycetous yeast forming yeast like budding cells along with true mycelia and arthroconidia. It grows in SDA at 24°C and 37 °C with in 24 hrs. It produces arthrospores in corn meal agar. *T. asahii* is responsible for causing white piedra and onychomycosis in immunocompetent hosts. It has been associated with causation of various localized and disseminated invasive infections in immunocompromised hosts. Cases of *T. asahii* infections are on the rise in immunocompromised and hospitalised patients. UTI by *T. asahii* has rarely been reported. Its diagnosis is likely to be missed or misinterpreted because of unawareness. Therefore *T. asahii* deserves recognition as a pathogen.

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FIGURE 1: Colony morphology of the isolate on CLED agar, after 24 hrs of aerobic incubation at 37 deg C.



FIGURE 2: Gram stain morphology of the isolate,



FIGURE 3: Colony morphology on SDA tube after 24 hrs of aerobic incubation at 37 deg C.

CASE REPORT

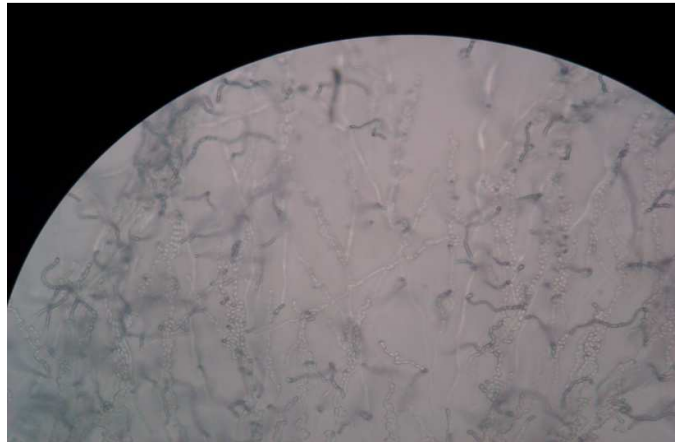


FIGURE 4: Corn meal agar morphology after 48hrs of incubation

SCREENING FOR BLOOD SUGAR LEVELS AMONG YOUNG ADULT MALES ATTENDING MEDICINE OPD AT MIMSH, MANDYA CITY, KARNATAKA, INDIA

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ABSTRACT: BACKGROUND: The number of young adults seeking care for diabetes related complications has been constantly on the rise in our hospitals. This fact prompted us to take up this study. **OBJECTIVE:** To screen all the young males aged between 20- 30 years attending medicine OPD at MIMSH, Mandya City, for blood sugar levels. **METHODOLOGY:** A descriptive study of 6 months duration was taken up at Medical College Hospital MIMS, Mandya. All the consenting adult males were subjected to screening by capillary blood prick using Glucometric Random Blood Sugar level (GRBS) using electronic glucometer (Accucheck active) and sensor comfort strips. **RESULTS:** 635 (95.84%) males had normal blood sugar levels at the time of screening. However, 49 (7.16%) had blood sugar levels above the normal. 32 (4.67%) males had impaired blood sugar levels and 17 (2.48%) had blood sugar levels in the diabetic range. The mean blood sugar levels were 101 mg / dl with a standard deviation of 19.73 mg/dL. **CONCLUSIONS:** Screening for blood sugar levels among the young adult males has been effective in early detection of impaired sugar level and hence at increased risk of diabetes. **KEY WORDS:** Screening, Impaired glucose tolerance, Diabetes mellitus, Young adults

INTRODUCTION: India has acquired the dubious distinction of being called “the diabetes capital of the world” [1]. The total number of people suffering from diabetes in India is 62.4 million. Another 77.2 million people are living with pre-diabetes. [2]. This number has increased by 11 million over the last one year [3]. One in every sixth adult Indian is a diabetic. Diabetes, once a disease of the people in their forties and fifties is now being diagnosed increasing among the younger age people [4]. The disease diabetes once thought to be the disease of the urban dwellers is now making its mark in a big way in the peri urban and rural areas [5], affecting every section of the population men, women, young and the old alike [6]. However, ever increasing number of young adults being newly diagnosed of diabetes or seeking care for diabetes related complication at our medical college hospital compelled us to take this study. This study aims at early detection and initiate of appropriate treatment for those detected of diabetes [7]. Also provide diabetes specific education and promote preventive measures for all the young adults aged between 20- 30 years [8] attending medicine OPD at MIMSH.

ORIGINAL ARTICLE

OBJECTIVE OF THE STUDY: To screen the young adults aged between 20- 30 years attending medicine OPD at MIMSH, for impaired glucose tolerance and diabetes mellitus using the standard glucometer method.

METHODOLOGY: All the patients aged 20-30 years attending Medicine OPD on first unit days between 9 am and 4 pm were asked to participate in the study. Those patients willing to give a written informed consent were enrolled for the study. A descriptive study was planned for a period of 6 months from June 2010 to November 2010. A total of 1156 young adults were eligible for the study, however, only 684 subjects consented to participate in the study. This paper presents the excerpts of the results of young adult males screened during the study. The results of screening young adult females have been analyzed separately to reduce the obvious selection bias as majority females in the age group 20-30 years attended obstetric and gynecology OPD. This paper presents results of of male subjects only.

The consenting subjects were subjected to screening of blood glucose level by glucometer method. A standardized glucometer with sensor comfort strips were used for the study. The glucometers used for the study were calibrated and standardized before the start of the study. A group of student volunteers were trained in the procedure of obtaining the capillary blood from the subjects. In order to standardize the procedure of capillary blood testing for blood sugar, reduce inter and intra observer bias, the student volunteers involved in the conduct of the study, had to take a test and completing the test successfully before being enrolled as volunteers.

Study subjects were patients aged between 20-30 years attending the medicine OPD for any medical condition / ailments. Random blood sugar levels were tested using the glucometric sensor comfort strips. A minimum of 3 hours had to be elapsed after the last meal (breakfast or Lunch) before subjecting the subject for glucometric blood sugar estimation. The results were compiled and analyzed using Microsoft excel and epi info softwares.

Standardization of the glucometer and deciding the cut-off point for the purpose of screening of young adults during the study: On average, blood readings from Accucheck active were higher than laboratory plasma sugar estimation. However, the sensitivity of Accucheck active was 72 %. Specificity and positive predictive value of glucometer was 100%. Negative predictive values of glucometers were approximately 95%. Depending on the above, and on incorporation of correction factor, the cut-off levels for screening were worked out. In this screening study, <142 mg/dL as normal, 143 mg / dL to 161 mg / dL as Impaired glucose tolerance level and > 162 mg / dL for diabetes mellitus. However, all the subjects in the abnormal sugar levels were called for fasting oral glucose challenge test and the results were confirmed.

ETHICAL CLEARANCE: The study has obtained institutional ethical committee approval.

RESULTS: A total of 1156 male subjects were eligible to participate in the study. However, only 684 (58.71%) males consented to participate in the study. The average age of the subjects was 23.53 years. Lack of time and fear of prick were the most common reasons given by those now willing to participate in the study.

73 (10.67 %) of the subjects were illiterate. 173 (25.39 %) subjects had completed primary education, 165 (24.12 %) high school, 134 (19.59 %) college, 116 (16.95 %) had bachelor's degree and 23 (3.36 %) had a master's degree.

171 (14.68%) subjects were students not involved in any income producing activities, 116 (16.95%) subjects were manual laborers, 227 (33.18%) were involved in clerical work, 159 (23.24 %) were involved in semiprofessional work like tailoring, driving, garment factory worker etc and 11(1.60%) were professions like lawyers, doctors or engineers.

Modified BG Prasad's socio-economic status classification was used for assessment of socio-economic status of the subjects. Majority subjects 307 (44.88%) belonged to class III, 112 (16.37 %) to class IV, 136 (19.88 %) class II, 94(13.74%) to class I and 35 (5.11%) belonged to class V.

182(26.60%) subjects gave history of at least one of their family member or a first degree relative, suffering from diabetes mellitus.

Table 1: Distribution of screening results of subjects according to blood sugar levels (N=684)

Accucheck glucometer capillary glucose values	Number of males subject (%)
<142mg/dL Normal	635 (92.84%)
143-161mg/dL Impaired glucose levels	32(4.68%)
>162mg/dL Diabetes mellitus	17 (2.48%)
Mean \pm 2 SD in mg / dL	101 \pm 39.46
Total	684 (100.00%)

635 (95.84%) subjects had normal glycemic levels at the time of screening and 49 subjects (7.16%) had blood sugar levels above the normal. Of the subjects with abnormal sugar levels, 32 (4.67 %) had impaired glucose tolerance and 17 (2.46%) had blood sugar levels in the diabetic range. The mean blood glucose levels were 101 mg / dL, with a standard deviation was 19.73 mg /dL.

The subjects with abnormal sugar levels were invited for a confirmatory Oral Glucose Tolerance Test (OGTT). 12 subjects agreed to undergo OGTT. 8 subjects were confirmed to be having impaired glucose tolerance and 4 subjects OGTT results were normal. The subjects attending the same were given diabetes specific health education and put on non-pharmacological therapy.

Of the 17 subjects diagnosed to be diabetic by the screening test, 15 of them were confirmed of diabetes. These subjects were put on pharmacological therapy for diabetes. However, 2 subjects had very high values of blood sugar by screening and were found to be normal on repeat test.

The average weight of the subjects was calculated to be 63.87 kilograms and average height was 169.05 cms. The average waist hip ratio was 0.89.

ORIGINAL ARTICLE

CONCLUSION: The yield of screening for blood sugar levels using capillary finger prick blood at the OPD, among the young adult males has shown moderate success in early detection of subjects with impaired and higher glycemic levels. Capillary finger prick blood method with electronic glucometer is a less invasive method for screening for early diabetes, requirement of trained manpower, cost of the procedure, were challenges we encountered. However, a yield of 7.16% abnormal sugar levels among the young adult males aged 20-30 years (study subjects) is a matter of grave concern. Authors recommend that every available outlet like waiting place at the OPD, waiting time in the OPD queue is used to dissemination appropriate Information, education and communication (IEC) for a healthy lifestyle among the young adults, including facilities for early screening for diabetes. This move can help early diagnosis, appropriate treatment and prevention of complications due to diabetes.

FUNDING: The study was taken up as a part of regular academic research activity funded by the Government of Karnataka through the Medical College Hospital funds.

CONFLICT OF INTEREST: None.

ACKNOWLEDGEMENTS: The Director, Medical Superintendent, Faculty and Staff of department of General Medicine and Community Medicine, MIMS, Mandya, Karnataka.

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PREVALENCE OF PREHYPERTENSION AMONGST MEDICAL STUDENTS IN COASTAL KARNATAKA

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ABSTRACT: AIMS: The main aims were to assess the incidence of prehypertension amongst the medical students in our institution with its correlation with increasing Body Mass Index(BMI) & to see if there was any gender variation. **MATERIALS & METHODS:** A total of 500 medical students consented to participate in this study, their BP reading were recorded after a demographic questionnaire to assess their socioeconomic status & BMI. **RESULTS:** 277 students (55.4%) were prehypertensives out of which 145(29%) students had a high SBP & 132(26.4%) had high DBP. Amongst the 227 students, 33.2% had both high SBP & DBP out of which 64.1% were boys & 35.9% were girls. In the entire study population, out of the 500 students, 25% of the boys & 40% of the girls were overweight. **CONCLUSIONS:** In our centre we had more than 50% of the study group in the prehypertensive range with a higher incidence amongst boys & about 40% of the girls were overweight. These figures are alarming & hence a followup study is required for further analysis.

KEY WORDS: prehypertension, Karnataka, medical students, BMI

INTRODUCTION: Hypertension is an independent predictor of cardiovascular disease and cerebrovascular events affecting nearly a quarter of the adult population worldwide. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) defines hypertension as blood pressure >140/90 mmHg. Persons with blood pressure above optimal levels, but not clinical hypertension (systolic blood pressure of 120-139 mm Hg or diastolic blood pressure of 80-89 mm Hg), are defined as having "prehypertension". Subjects with pre-hypertension have a greater risk of developing hypertension later and risk of major cardiovascular events independent of other cardiovascular risk factors. Cardiovascular diseases contribute to atleast one third of deaths in India every year. Although hypertension has been well studied, there is dearth of data on the prevalence and risk factors for prehypertension in India.

With India emerging as an economically developed nation, the need of the hour is to focus research and data collection on urban as well as rural population. Studies targeting prehypertension would provide an estimate of the future magnitude of the problem and assist in developing strategies for control of hypertension and CVD (1). With growing urbanization, sociodevelopmental and life style changes from traditional to modern have lead to physical inactivity. Rising affluence has also modified the dietary pattern characterized by increased

ORIGINAL ARTICLE

consumption of diets rich in fat, sugar and calories(4). The all cause mortality has also been shown to be 50% higher in the prehypertensive adults compared to the normotensive counterparts.

There are not many studies done in this part of the country which estimates the prevalence of this epidemic & hence the study was planned. Drug therapy for prehypertension is not recommended for various reasons (2,3). Our study population consisted of students enrolled in a medical school who were from similar socioeconomic status, dietary habits & lifestyle. Early identification of prehypertension in this subgroup plays an important role in screening for metabolic syndrome and identifies modifiable factors required for proposing prevention strategies for prevention of cardiovascular accidents.

AIMS AND OBJECTIVES: To find out the incidence of prehypertension amongst medical students in our institution To show any possible correlation between high normal BP & increasing BMI To assess any gender variation in the incidence of prehypertension

METHODS: This was a cross-sectional study done where 500 consenting students in the age group 18-22 years were randomly selected. The in-house ethical clearance was taken & all standards were adhered to including a detailed informed consent to participate in the study. Their demographic data was collected which included their height, weight, habits. BMI was calculated using the standard international formula. To measure the blood pressure a mercury sphygmomanometer was used. We made sure there was no smoking or caffeine ingestion half an hour prior to the checking of their blood pressure. A cuff bladder encircling at least 80% of the arm circumference was applied to the nondominant arm. The disappearance of phase V Korotkoff sounds was taken as the diastolic reading. The mean of three readings, recorded 2 min apart, was taken. If these readings differed by more than 5 mm Hg, a further three readings were recorded at 2 min intervals, and the mean of all six readings taken. The radial pulse rate was manually recorded over a 1 min period. The individuals were categorised as normotensives & prehypertensives. Known hypertensives & students on antihypertensive management & non consented students were excluded from the study.

RESULTS: The sample of 500 students was analysed by applying ANOVA logistic regression analysis. Out of a total of 500 students, there were 267(53.4%) boys & 233(46.6%) girls. 277 students (55.4%) fell in the prehypertensive range out of which 145(29%) students had a high SBP & 132(26.4%) had high DBP. Amongst the 227 students, 92(33.2%) had both high SBP & DBP out of which 93 (64.1%) were boys & 52 (35.9%) were girls.

There was a family history of hypertension in one parent in 153 students (30.6%) & that of both parents in 30 students (6%) in the entire study group out of which 67 (13.4%) of them were prehypertensives. However there were no subjects who were hypertensive in our study. Out of the 500 students, 66 boys (24.7%) & 93 (39.9%) girls were overweight (BMI more than the normal range).

There was significant correlation between prehypertension & a raised BMI with a P value less than 0.05 in boys but on the contrary, there was no significant correlation between the two in the girls (P value more than 0.05).

SPSS 2 version was used for data analysis, Student t-test was used to calculate the Karl Pearson's correlation coefficient.

DISCUSSION: Hypertension is a known risk factor for cardiovascular accidents well studied across the globe. Pre hypertension is a potential modifiable risk factor preceding hypertension. Physicians across the globe are found to have higher prevalence of metabolic syndrome than previously expected. There is an urgent need to estimate the risks among the healthcare professionals. From our analysis of nearly 55% of our students fell in the prehypertensive range which is more than the general population. Amongst the prehypertensives (n=277), 93(33.2%) of them had both elevated systolic & diastolic blood pressures which puts them at a higher risk than those with only elevated systolic or diastolic BP. We hypothesize that the medical students undergo similar or more stress during their training period with little physical activity, altered food habits and recreational social habits like smoking & alcohol might have accentuated our finding. All the students in our study group belonged to the same socioeconomic strata & consumed the same kind of food.

Among the prehypertensives, we found a favourable outcome for girls (64% among boys and 36% among girls) probably due to the protective action of estrogen. The role of estrogen in hypertension is not clear as some data suggests otherwise (HRT in women). More data & deeper insight into this possibility needs to be assessed. In our present study group 66 boys were categorized as overweight with a positive correlation with high blood pressure. Influence of gender in hypertension prevalence has been observed among men who showed higher prevalence of both systolic and diastolic hypertension in young age (11). In the present study analysis we have identified a previously underestimated subgroup of prehypertensives in concordance with the JNC-VII criteria, which needs special attention to avoid progression to hypertension and possible cardiovascular disease.

In our study group 183 students (36.6%) had a positive family history of hypertension which accounts to more than one third of the study population. This obviously implies that a strong family history is an independent risk factor & those students are prone to develop prehypertension prematurely. Thus tackling them should be our prime priority to prevent or delay future comorbidities.

The public health implication of this increased burden of at-risk people in our population requires serious consideration. It has been estimated that a 5 mmHg reduction in systolic blood pressure in the population will produce a 14% reduction in the risk of stroke and a 9% reduction in the risk of coronary heart disease (12). The present study stresses the need to target this subgroup of prehypertensives more aggressively to prevent the epidemic of hypertension and its sequelae like coronary artery disease and chronic kidney disease. It has been shown that overweight status and increasing age are potential risks for future development of hypertension thus obesity management and lifestyle modifications are potential factors in the prevention of hypertension (1) and we stress the need to inculcate this in the early training period among the medical students to keep the health care fraternity in better shape. Prehypertension & hypertension are also significant risk factors for the development of insulin resistance & hence metabolic syndrome which is reported frequently in India. Presently pharmacological therapy has not been recommended to treat prehypertension except for those with other comorbid risk factors (13).

Strength of this study was a large group of medical students from a homogenous age and socioeconomic background. There is limited data among Indian literature in this population. Limitation of this study was absence of follow-up.

ORIGINAL ARTICLE

CONCLUSION: We conclude that we have an alarming number of prehypertensive subgroup in the community which needs to be identified and informed of the future complications. Prehypertension is potentially modifiable with simple lifestyle modifications. The prevalence is higher among the healthcare providers than previously expected.

ACKNOWLEDGEMENTS: We deeply acknowledge Indian Council of Medical Research (ICMR), New Delhi, for funding this project in the form of Short Term Students Research Programme (STS) & are grateful to all the participants who also made this possible.

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ORIGINAL ARTICLE

RESULTS: WHOLE SAMPLE

Variables	SBP between 121 & 139		DBP between 81 & 89	
	Pearson's coefficient	p value	Pearson's coefficient	p value
BMI & SBP	0.176	0.034 (<0.05)	0.315	0
BMI & DBP	0.129	0.123 (>0.05)	0.031	0.727

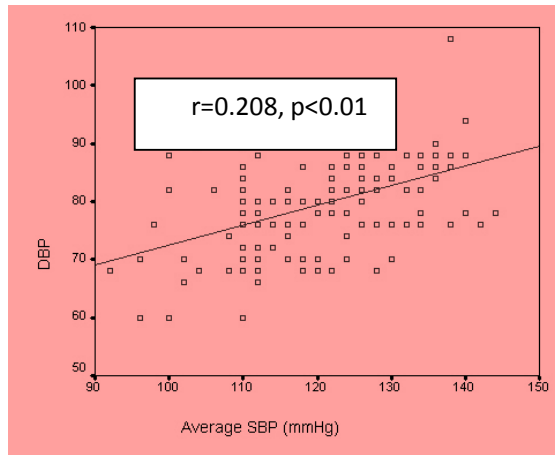
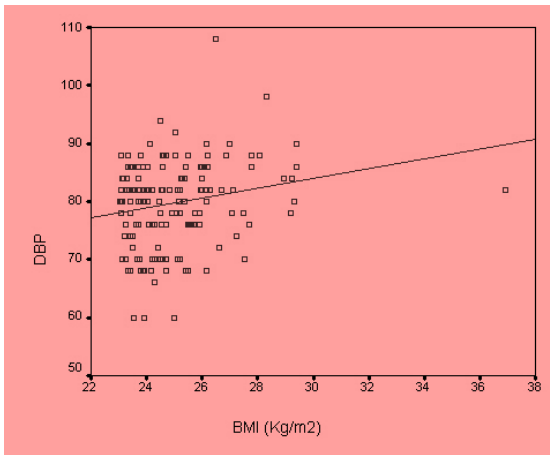
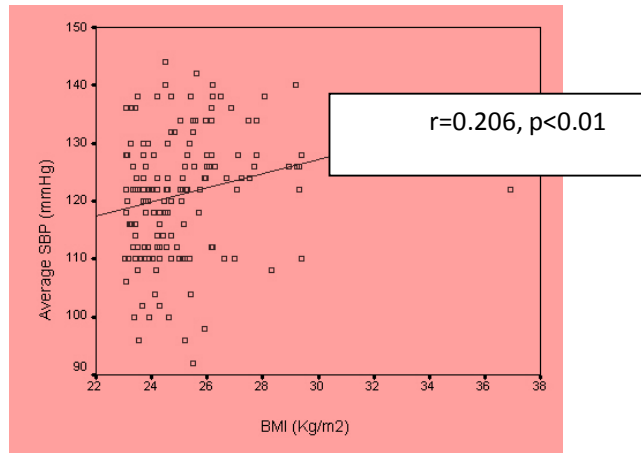
CORRELATION BETWEEN TWO VARIABLES WITH REGARDS TO GENDER (WHOLE SAMPLE)

Variables	Male		Female	
	Pearson's coefficient	p value	Pearson's coefficient	p value
BMI & SBP	0.300	<0.0001	0.310	<0.0001
BMI & DBP	0.268	<0.0001	0.216	<0.01

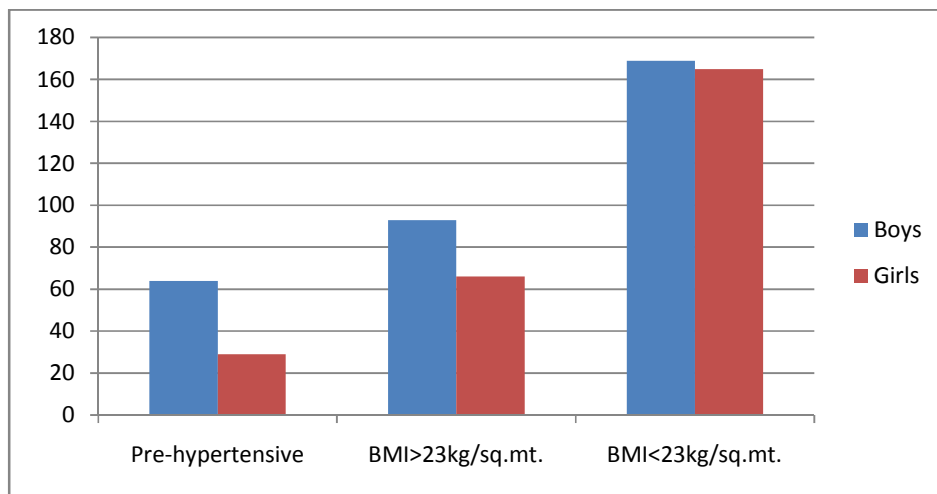
CORRELATION BETWEEN TWO VARIABLES WITH REGARDS TO HIGH BMI

Variables	Male		Female	
	Pearson's coefficient	p value	Pearson's coefficient	p value
BMI & SBP	0.285	<0.006 (<0.01)	0.047	<0.710 (<0.05)
BMI & DBP	0.232	<0.025 (<0.05)	0.136	<0.3 (<0.05)

Scatter diagram with line of regression (linear)-BMI>23kg/sq.mt (n=145)



Bar-chart showing difference in male and female groups



Data: there are 64 boys and 29 girls among pre-hypertensive. 93 males and 66 females are having BMI>23 and 169 males and 165 females are having BMI<23.

EVALUATION OF INGUINAL HERNIA REPAIR WITH PROLENE MESH AS DAY CASE SURGERY.

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ABSTRACT: BACKGROUND: Day case surgery is still in its infancy in India and inguinal hernia repair is one of the most common surgical procedures performed. Various techniques are advocated by different surgeons for repair of inguinal hernia repair. Present study was done to evaluate inguinal hernia repair with prolene mesh as day case surgery. **MATERIALS AND METHODS:** 40 patients underwent inguinal hernia repair in various surgical wards of Guru Nanak Dev hospital attached to Government medical college, Amritsar using polypropylene mesh under local anaesthesia on ambulatory basis. Patients were assessed for feasibility of repair under local anaesthesia on day case basis. **RESULTS:** We observed that most of the patients (90%) were operated upon under local anaesthesia and 75 % patients were discharged on the same day. **CONCLUSION:** Lichtenstein tension free hernia repair can be safely performed under local anaesthesia on day case basis. It is an inexpensive and effective procedure and the economic benefits are enhanced by low morbidity, low recurrence rate and early return to normal activities.

KEY WORDS: Day Case, prolene mesh repair, local anaesthesia

INTRODUCTION: Historic development of inguinal herniorrhaphy dates back to Bassini's contribution in 1892 and subsequent various modifications and procedures culminating in present day simplified tension free mesh repair techniques in repair of hernia¹. Tension free repair for inguinal hernioplasty was first popularized by the Lichtenstein Hernia Institute in 1986².

Top priorities for successful day case surgery include the four A's- alertness, ambulation, analgesia and alimentation. The earliest reference for day case surgery is mentioned as early as beginning of the 19th century by James Nicoll a Glasgow surgeon who performed outpatient operations on children in 1903³ and later in 1912 when Ralph Waters from Iowa, USA described The Down Town Anaesthesia Clinic⁴.

Present study was planned to evaluate inguinal hernia repair with prolene mesh as day case surgery in 40 cases.

PATIENTS AND METHODS: After approval from the ethical committee and written informed consent 40 patients were enrolled in the study. Detailed history, physical examination and necessary investigations were carried out. All patients were operated upon under local infiltration and in uncooperative patients help of anesthesiologist was sought.

ORIGINAL ARTICLE

A mixture of lignocaine (2%) 3.5mg/kg and bupivacaine (0.5%) 2mg/kg were used for infiltration. 3 ml of sodium-bi-carbonate (7.5%) was added to the solution. The patient suffering from any bleeding disorder, having obstructed or strangulated inguinal hernia and Nyhus type I hernia were excluded from study.

OPERATIVE TECHNIQUE: Operation was based upon Lichtenstein repair, done under local anaesthesia with excision of indirect sac and inversion of direct sac. A prolene mesh 3" x 6" was used as an onlay patch for hernia floor repair . A slit was made in mesh to accommodate the cord. Mesh was fixed to inguinal ligament inferiorly, conjoint tendon superiorly and transversalis fascia with interrupted prolene 2-0 suture. The closure of external oblique aponeurosis, subcutis and cutis was done in layers .

Postoperative management

In the post operative period patients were encouraged to be ambulatory soon after the operation and were discharged on the evening of operation if all the discharge criteria were met . On discharge, an oral combination of Diclofenac Sodium 50 mg, acetaminophen 500 mg and oral antibiotics were prescribed for 5 days. Discharge criteria used were-

- Vital signs must have been stable for at least 1 hour and patient must be oriented to person, place and time.
- Able to retain orally administered fluid.
- Able to walk without assistance, void and dress.
- The patient must not have more than minimal nausea or vomiting, excessive pain or any bleeding.

Follow up The patients were followed up for 6 months at 3 weeks, 3 months and 6 months for any recurrences or complications.

RESULTS: In the study all patients were males. The maximum incidence of the hernia was found in the 7th decade (60-69 years) of life. The size of the hernia was small to massive. Types of hernias are shown in figure 1. 36 (90%) cases were done under local anaesthesia, two patients required spinal anaesthesia while two patients required additional sedation during surgery (figure2).30 patients were discharged on the same day (figure 3).All the patients were given follow up. All the patients turned up for regular follow ups. Various complications seen are listed in figure 4 .

DISCUSSION: Recent advances in anaesthetic and surgical techniques along with escalating health care cost have resulted in increasing number of surgical procedures being performed on day case basis.

The life time risk of undergoing hernia operation is 27% for men and 3% for women⁵. The Lichtenstein tension free repair opened a new era in groin hernia repair with superior results over prior methods. In this repair, the inguinal canal is approached from an open anterior approach after dividing the skin, scarpa fascia and external oblique aponeurosis. The cord is examined for an indirect sac, any direct hernia is reduced and the floor is reinforced with a piece of flat polypropylene mesh that is sewn to the conjoint tendon and the shelving edge of the inguinal ligament. The mesh is slit to accommodate the cord structure .This repair has a very low learning curve and can be readily performed under local anaesthesia specially in patients who are at high risk for general anaesthesia.

Open mesh repair popularized by Lichtenstein has significantly reduced recurrences compared with conventional open nonmesh repairs⁶. This finding was also supported by several other studies and it has been stated that using a mesh for open repair reduces recurrence rate by 50% to 75% when compared with open suture repair⁷⁻⁸.

The present study was done to assess the feasibility of Lichtenstein mesh repair for inguinal hernia under local anaesthesia as day case surgery. 36 (90%) cases were done under local anaesthesia. Two (5%) cases were done under spinal anaesthesia because one was associated with undescended testis and other was recurrent hernia. In two (5%) cases help of anaesthesiologist was sought because patients were very uncooperative during operation.

30 patients were discharged on the day of operation as day case basis. Five patients were discharged on the first post operative day because of complaint of moderate to severe pain on the day of operation. Three (7.50%) patients were discharged within five post-operative day. Two (5%) patients were discharged after suture removal on 7th post-operative day.

There were three (7.5%) cases of wound infection treated by antibiotics and anti inflammatory drugs along with antiseptic dressing. There was a single case of wound haematoma treated by sterile syringe aspiration under all possible asepsis. The patients were prescribed anti inflammatory drugs and antibiotics orally. There were two (5.0%) patients of scrotal swelling who were treated by scrotal support and anti-inflammatory drugs.

Tension free repair of 1098 inguinal hernia in 1017 patients has been assessed. The operation was conducted under local anaesthesia and the inguinal canal floor was reinforced by polypropylene mesh. Patients were discharged home on the same day. There was no mortality, no urinary complication and there was only one case of venous thrombosis. There was one recurrence after a primary hernia repair and two patients have developed recurrence after repair of a recurrent hernia. The overall sepsis rate was 0.9% . None of the prosthesis required removal⁹. In our study there was not even a single case of recurrence and mesh removal after operation.

In study for comparison of local, spinal and general anaesthesia for inguinal herniorrhaphy it was shown that local anaesthesia is suitable for day case hernia repair with fewer postoperative problems¹⁰.

Similarly 2906 adult patients with 3,175 primary inguinal hernia had repair on a day case basis under local anaesthesia by an open tension free mesh technique. Out of these patients 20 (0.8%) patients required general anaesthesia. All patients were discharged two hours after operation. There was no case of urinary retention and testicular atrophy. The incidence of deep infection was 0.3% and of haematoma 2%. There were eight recurrences within 18 months to 5 years follow up¹¹. In our study, there was no case of urinary retention, testicular atrophy, mesh removal or recurrence. There was only one case of wound haematoma, one case of each superficial and deep wound infection and two cases of testicular swelling.

Lichtenstein repair on 64 patients of inguinal hernia to assess the feasibility of open tension free mesh repair of inguinal hernia on ambulatory basis showed that 84.4% patients were safely operated with minimal morbidity rate of 14.0%¹².

A study on 1000 patients of primary and recurrent hernia to evaluate the feasibility of unmonitored local anaesthesia showed that unmonitored local anaesthesia was converted to general anaesthesia in only five cases. Two patient required anaesthesia monitory care . Surgery was completed under unmonitored local anaesthesia in 993 cases (99.3%). Out of total patients 961 were discharged on the day of surgery¹³. In our study 36 patients out of 40 were

ORIGINAL ARTICLE

successfully operated under local anaesthesia and two patients required spinal anaesthesia. Only two patients required sedation intraoperatively.

CONCLUSION: Lichtenstein tension free hernia repair has opened a new era in hernia surgery and highly successful results of technique are confirmed by this small prospective study. It can be safely performed under local anaesthesia on day case basis. It is an inexpensive and effective procedure and the economic benefits are enhanced by low morbidity, low recurrence rate and early return to normal activities.

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FIGURE 1 TYPE OF HERNIA

Right indirect inguinal hernia	21(52.50%)
Right direct inguinal hernia	7(17.50%)
Left indirect inguinal hernia	8(20.0%)
Left direct inguinal hernia	4(10.0%)
Recurrent inguinal hernia	1(2.50%)
Total	40 (100%)

FIGURE 2 SHOWING TYPE OF ANAESTHESIA

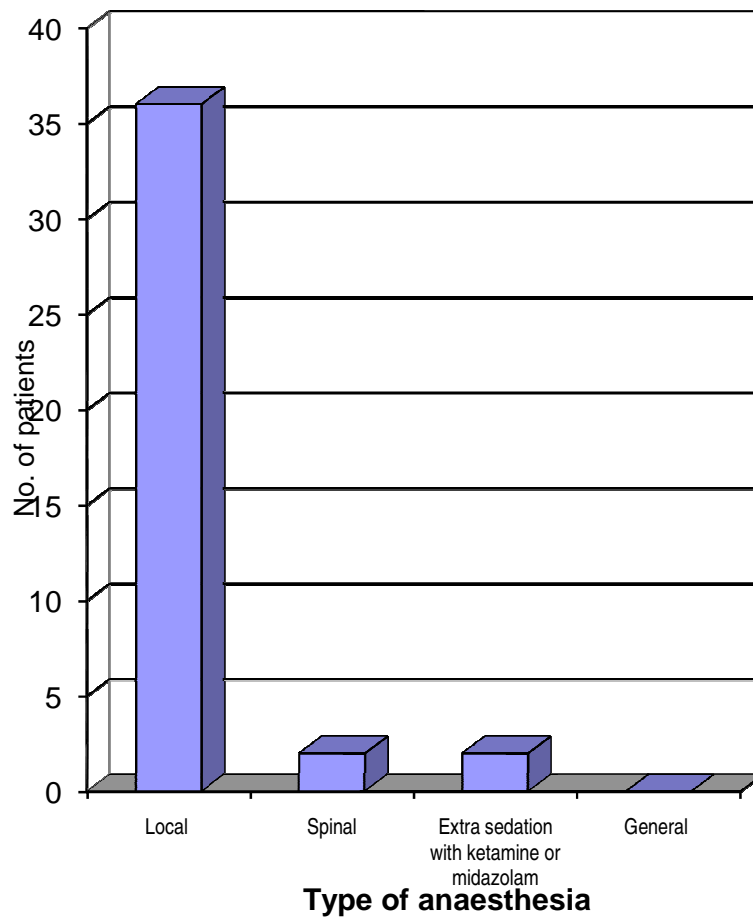


FIGURE 3 SHOWING POSTOPERATIVE HOSPITAL STAY IN DAYS

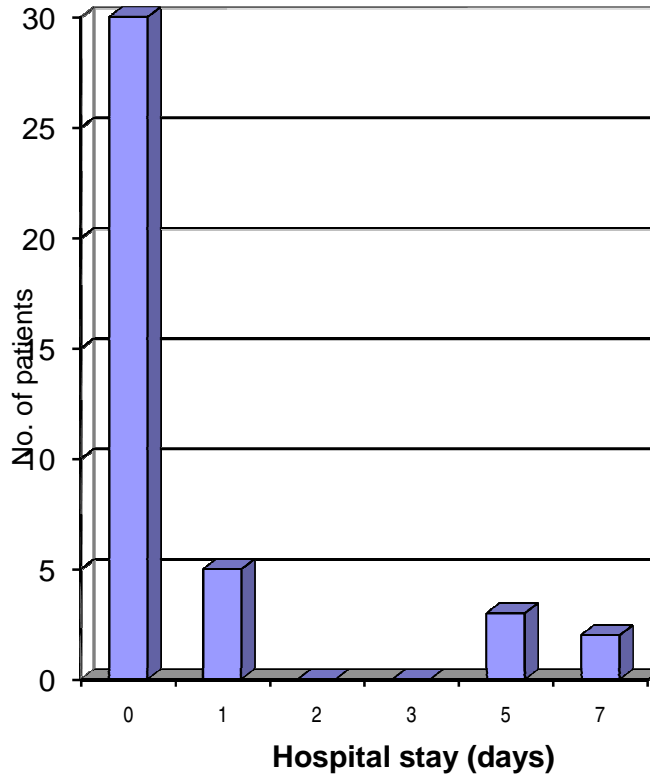


FIGURE 4 - SHOWING POSTOPERATIVE COMPLICATIONS

Postoperative complications	No. of patients	Percentage
Urinary retention	-	-
Wound haematoma	1	2.50
Infection of wound (superficial)	2	5.00
Infection of wound (deep)	1	2.50
Testicular atrophy	-	-
Mesh removal	-	-
Testicular neuralgia	-	-
Testicular swelling	2	5.00
Recurrence	-	-

COMPARATIVE UTILITY OF BONE MARROW ASPIRATION AND BONE MARROW BIOPSY

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ABSTRACT: The bone marrow examination is valuable in the diagnosis of certain hematological and non-hematological conditions and has been a cornerstone of hematology practice. Bone marrow can be obtained in two ways: 1.by needle aspiration and 2.by trephine biopsy.

Initially, aspiration techniques were more popular in view of the simplicity of the procedure, good representation of marrow cells' morphology and ready acceptability by the patient. However knowledge about diagnostic limitations of aspirated marrow, coupled with introduction of simplified percutaneous needle biopsy procedures (under local anesthesia) led to a progressive increase in the use of bone marrow trephine biopsy as an indispensable adjunct to bone marrow aspirations.

In this study we compared results and utility of bone marrow aspiration and bone marrow biopsy. Total 27 BMA and BMB were performed. BMA alone is sufficient in making diagnosis in 70% cases while remaining 30% cases required BMB for diagnosis. Bone marrow aspirate smears are ideal for the study of cytological details of haemopoietic cells. Trephine biopsies are superior to bone marrow aspirates particularly for the assessment of cellularity, extent and pattern of tumor infiltration and cell type. Valuable information on the status of hematopoiesis and changes in stromal components is also provided by trephine biopsy specimen.

Today, both procedures are considered complementary to each other.

KEY WORDS: BMA: bone marrow aspiration, BMB: bone marrow biopsy.

INTRODUCTION: Bone marrow examination is necessary investigation for diagnosis and management of many hematological and non hematological diseases. It is also useful in follow up of patient of chemotherapy and bone marrow transplants. For bone marrow examination two types of samples – BMA and BMB can be obtained. Marrow biopsy by surgical trephine is an older procedure than needle aspiration. It is only since the late 1950s that core needle biopsy of the bone marrow has been used [1] but BMA is simple, minimally invasive technique. However BMA has lower sensitivity in detecting solid tumour metastasis and lymphoma involvement in comparison to BMB. [2] BMB is more reliable method of detecting marrow infiltrate. [3] And pattern of marrow involvement. For detecting cellularity of marrow BMB is more reliable than BMA.

ORIGINAL ARTICLE

Nowadays aspirate and trephine biopsy specimens are considered complementary and when both are obtained, they provide a comprehensive study of bone marrow.^[4]

MATERIALS AND METHODS: The present study was carried out in the department of pathology, medical college. It comprises all the bone marrow biopsies performed on patients admitted to teaching hospital. Patients were reviewed irrespective of age and sex.

In each case a detailed history along with systemic, general and local examination and routine hematological investigation was carried out prior to bone marrow trephine biopsy. The histopathology findings and the diagnosis made on the biopsies were compared with the findings on the bone marrow aspirate and diagnosis.

Patients were explained about the procedure. They were informed about possible complications but also assured for safety, simplicity and usefulness of the procedure and written consent was taken from relative or patient himself.

The patient is placed in the lateral decubitus position, with the top leg flexed and the lower leg straight. The site is prepared, cleaned with an antiseptic (usually Betadine) scrub, and draped, exposing only the biopsy area. The skin and the area down to the periosteum are infiltrated with a local anesthetic (eg, 1% Xylocaine). Approximately 10 cc of 1% Xylocaine is used. A skin incision is made with a small surgical blade, through which the bone marrow aspiration and biopsy needles are inserted. The bone marrow aspiration needle, with a stylet in place, is inserted. Once the needle contacts the bone, it is advanced by rotating clockwise and counterclockwise slowly until the cortical bone is penetrated and the marrow cavity is entered. Usually, a sudden change is noted when the marrow cavity has been entered. Once within the marrow cavity, the stylet is removed, and, using a 20-cc syringe, approximately 0.5cc of bone marrow is aspirated for pathology slides. Slides are made and fixed it with methanol after drying. The marrow aspiration needle is removed, and pressure is applied to the site with gauze until bleeding has stopped. Following this procedure, a bone marrow biopsy usually is performed. The needle is held with the palm and index finger, and the stylet is locked in place. Once the needle touches the bone, the stylet is removed. Using firm pressure, slowly rotate the needle in an alternating clockwise-counterclockwise motion and advance it into the bone marrow cavity to obtain an adequate bone marrow specimen measuring approximately 1.5-2 cm in length. Rotate the needle along its axis to help cut the specimen, pull back approximately 2-3 mm, and advance the needle again slightly, at a different angle, to help secure the specimen. Following this procedure, slowly pull the needle out while rotating in an alternating clockwise and counterclockwise motion. Remove the specimen from the needle with the probe supplied by introducing the probe through the distal cutting end. Place the specimen in formalin solution for histology processing.

After the procedure, several layers of gauze are applied to the site with an Elastoplast on top to immobilize the gauze, and the patient is instructed to check the site frequently, to report any bleeding, and to keep it dry. The dressing is removed 48 hours later.

Bone marrow aspiration slides are stained with Giemsa stain and special stains like Perl, Sudan, PAS whenever needed. Bone marrow biopsies were processed and stained with hematoxylin and eosin and special stains like **PAS** whenever needed.

OBSERVATION AND RESULTS: Total 27 bone marrow bone marrow trephine biopsy were performed. The number of bone marrow trephine biopsy performed is small because most the cases bone marrow aspiration was diagnostic like in cases of megaloblastic anemia, iron

deficiency anemia. Trephine biopsy is really helpful when there is a dry tap. Table 1 shows distribution of cases in bone marrow biopsy. Table 2 shows comparative evaluation of bone marrow cellularity by BMA and BMB.

Table 2 shows that number of case of dry tap and heavy admixed with blood which cause difficulty in evaluation the marrow was quite high (nearly 30% case) which may be due to wrong method or fibrosis or packed marrow. Out of 5 dry tap 3 were hyper cellular marrow and failure of aspiration is due to packed marrow. In those cases trephine biopsy proved to be diagnostic, and it also gives advantage of smear cytology by imprints smears of marrow. On aspiration smears, assessment of cellularity is not ideal for that biopsy is turn out to superior.

DISCUSSION: BMA and BMB are important for diagnosis of many hematological and non hematological malignancies, assessment of pyrexia of unknown origin, typing of anemia and in some infections. They also help in follow up of patient taking chemotherapy, bone marrow transplantation. [5, 6, 7, 8]

BMA used to study morphology, maturation stages of blood cells, differential counts, and assessment of myeloid to erythroid ratio. [3] While trephine biopsy gives information about cellularity, architecture and focal lesions like granuloma, metastasis.

As noted in table 2, there was a wide discrepancy between cellularity of the marrow as estimated by biopsy versus aspirate.

In hyper cellular marrow, bone marrow reported as hyper cellular on aspiration method was 54% which was similar to ralph [9] study. In present study remaining 46% cases was either dry tap or reported as heavy admixed with blood and not possible to assess the cellularity. In normo cellular marrow, marrow was reported as normo cellular on aspiration was only in 37.5%, while remaining 62.5% cases reported as either hyper cellular or hypo cellular marrow. In hypo cellular marrow, only 16.5% marrow was reported as hypo cellular by aspiration.

An important limitation of marrow examination obtained by aspirate is the admixing of marrow and sinusoidal blood, which may not allow for reliable estimates of marrow cellularity. This evaluation is of particular importance in the hyper cellular marrow which yields a "dry tap" or only dilutes sinusoidal blood. Thus, the use of the biopsy avoids misinterpretation of cellularity by smears in patients in whom the biopsy confirmed a normal, hypo cellular or hyper cellular marrow.

In present study percentages of dry taps are 18%, out of which 80% marrow are abnormal on biopsy. Only 20% marrows are normal. Table 3 shows comparative evaluation of dry tap in various studies. Out of 5 cases of dry tap one was acute leukemia, one was multiple myeloma, one was essential thrombocytosis. In these cases dry tap was due to pack marrow. One dry tap was due to myelofibrosis. One was normal marrow which may be due to faulty technique. It is necessary that finding of a 'dry tap' should never be dismissed as being due to faulty technique and always needs a bone marrow biopsy.

In this study, there were three case of Chronic Lymphoid Leukemia and all three have diffuse involvement of marrow, which can be seen on biopsy section, while aspiration only shows that marrow is involved. Pattern of marrow involvement by leukemic cells could be only analyzed by trephine biopsy. Not all patients with Chronic Lymphoid Leukemia required bone marrow examination because it is easily made by peripheral examination. However bone marrow assessment is indicated in patients in whom treatment is necessary, either those with more advanced disease or younger patients in whom intensive treatment is planned. [13] This should always include a trephine biopsy because bone marrow aspirate gives very little

ORIGINAL ARTICLE

information beyond that already available from examination of blood, where as trephine biopsy permits an accurate assessment of extend of infiltration and gives information of prognostic importance.^[14] A trephine biopsy is essential for follow up of intensive treatment because it may show residual focal disease when a marrow aspirate is normal.^[13]

In present study Reticulin stain was done and graded from 0 to 4 grades.

Out of 27 cases one case was of myelofibrosis [figure 3] with grade 4 Reticulin fiber, while those with leukemia had grade 1 to 2 Reticulin fiber contain. While those with anemia and normal marrow doesn't have any demonstrable reticulin fiber (grade 0).

In our study there are two cases of metastasis one from lymphoma and other from neuroblastoma[figure 4]. The combined procedures of aspiration and biopsy give a higher yield and are essential in patients with suspected carcinoma, non Hodgkin lymphoma and Hodgkin lymphoma.^[15] Bilateral aspirates with biopsies are required for diagnosis and in staging of Neoplasms and that a unilateral aspirate with biopsy is sufficient to assess patients with cytopenia or leukemia.^[16]

In present study aspiration alone was sufficient in making a diagnosis in 70% cases. In these cases trephine biopsy gives additional information. In the remaining 30% cases trephine biopsy was necessary for making a diagnosis due to incomplete information provided by aspiration or its inability to give a correct diagnosis.

The decision to perform a marrow aspiration alone or in combination with marrow biopsy depends on the diagnosis being considered. In nutritional anemias, most hematologic malignancies and immune thrombocytopenia, marrow aspiration alone is sufficient, but for detection of disorders with focal marrow involvement biopsies are must.^[17]

CONCLUSION: Aspiration is easy to perform while trephine biopsy is slightly more painful and requires more skill to perform. Aspiration is important to study the cytology of bone marrow while biopsy is more reliable in assessing cellularity and reticulin framework of marrow. Aspiration is far superior in case of anemia, leukemia while trephine biopsy is more useful when aspiration yield dry tape or heavy admixed with blood. It also gives much more information regarding abnormal localization of immature cells, pattern of metastasis, post chemotherapy to evaluate how marrow is responding to treatment or even in bone marrow transplantation.

Overall both the procedures are complimentary to each other and must be performed together for better evaluation of patient.

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TABLE 1: Distribution of Cases.

Type of Disease	Normal	Anemia	Acute Leukemia [figure 1]	Chronic lymphoid Leukemia	Metastasis
No.	07	04	04	03	02
Type of Disease	Myelo fibrosis	Chronic Myelo Proliferative Disorders	Myeloma	Storage Disease [Figure 2]	Total
No.	01	04	01	01	27

ORIGINAL ARTICLE

Table 2. Comparative evaluation of bone marrow cellularity by BMA and BMB.

		BMB		
	hypocellular	normocellular	hypercellular	Total
BMA				
Hypocellular	01	01	00	02
Normocellular	02	03	00	05
Hypercellular	02	03	07	12
Dry tap	01	01	03	05
Blood mixed	00	00	03	03
	06	08	13	27

Table 3: comparison of dry tap in various studies

Various study	Dry tap in aspiration[%]	Normal marrow in biopsy[%]	Abnormal marrow in biopsy[%]
Navone R et al ^[10]	5	0	100
Engeset A et al ^[11]	7	23	77
Humphries JE ^[12]	4	7	93
Present study	18	20	80

ACUTE LEUKEMIA

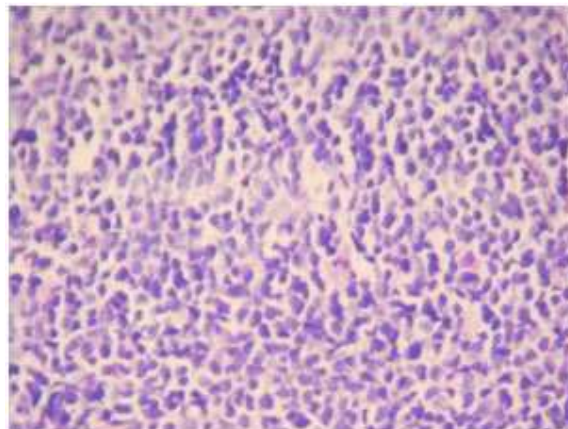


Figure 1. Acute leukemia - BMB shows blasts infiltrating the marrow and almost replacing the normal marrow [h & e stain 400x]

GAUCHER'S DISEASE

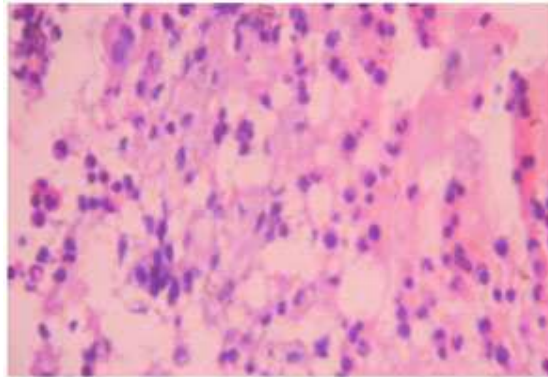


Figure 2. Gaucher's disease - BMB shows many gaucher cell infiltrating marrow and they are PAS positive [PAS stain 400x]

MYELOFIBROSIS:

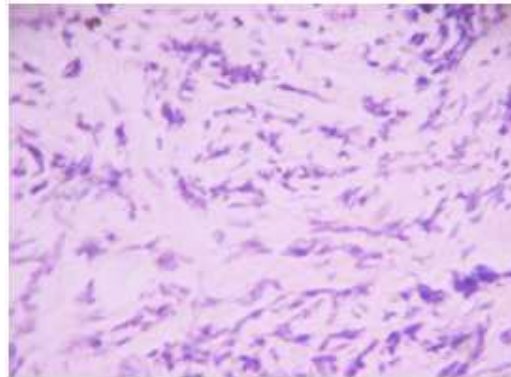


Figure 3. Myelofibrosis - BMB shows increased fibrosis and collagen deposition in myelofibrotic marrow [h & e stain 400x]

NEUROBLASTOMA:

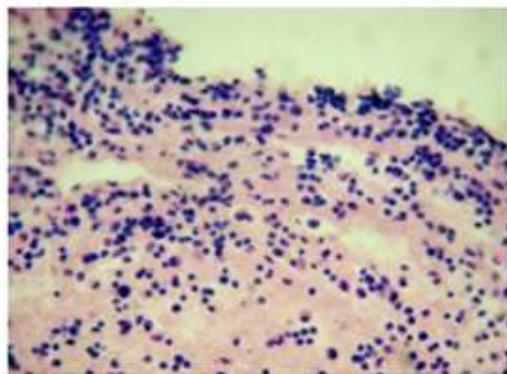


Figure 4. Metastatic neuroblastoma - section shows small round cells with scant cytoplasm infiltrating the marrow and fibrillary background

CASE REPORT & REVIEW ARTICLE

DIAGNOSIS OF SUBCUTANEOUS CYSTICERCOSIS IN SOFT TISSUE MASS OVER ANTERIOR ABDOMINAL WALL: A CASE REPORT AND REVIEW OF THE LITERATURE.

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ABSTRACT: BACKGROUND: Cysticercosis commonly presents as neural or intramuscular lesion. Rarely, it may present in soft tissues in the adult age group. **CASE DETAILS:** A 42-year-old male presented with pain and swelling over the right lateral abdominal wall. The pain was progressive towards sub-costal region. It was clinically diagnosed as Fibromatosis / Desmoid tumor. Abdominal ultra-sound revealed possibility of Desmoid / Dermoid / Infective cyst. Surgical excision was performed. The final diagnosis of Subcutaneous Cysticercosis was made based on the histopathological findings. **CONCLUSION:** Even though cysticercosis is common in brain and skeletal muscle, it is rare at subcutaneous location. Therefore the possibility of cysticercosis should be considered in the differential diagnosis of subcutaneous swelling in the adult age group.

KEY WORDS: subcutaneous cysticercosis, cysticercosis in soft tissue mass

INTRODUCTION: The adult *Taenia solium* tapeworms are found in the small intestine of humans, the definitive host, and the *Cysticercus cellulosae*, the larval forms of the tapeworm *Taenia solium* are found in the skeletal muscle of the intermediate host, the pig. To develop cysticercosis, a human has to replace the pig in the *T. solium* life cycle and the eggs must mature within the human small intestine as they would do in the pig's intestine. Entry of the eggs into the human small intestine may occur through autoinfection or by inhalation or ingestion of egg-contaminated food or water. Finally these cysticerci spread through the intestinal wall and are carried by the blood stream to muscles, brain and subcutaneous tissues, leading to clinical manifestations [1].

CASE REPORT: A 42-year-old male, known case of diabetes mellitus from Puducherry presented with swelling over the right lateral abdominal wall which had gradually increased in size over the previous year.

CASE REPORT & REVIEW ARTICLE

On examination swelling of size 2 x 1.8 cms was present in the right flank associated with localized pain which was progressive towards sub-costal region and was clinically diagnosed as Fibromatosis / Desmoid tumor.

Investigations revealed hemoglobin of 13.5 gm%. FNAC examination was in favor of costo-chondritis. Abdominal ultrasound revealed an irregular, heterogeneous, partly cystic mass measuring 1.8 x 1.7 cms, deep to subcutaneous tissue and superficial to external oblique aponeurosis suggesting Desmoid / Dermoid / Infective cyst. Surgical excision was performed & sample was sent for histopathology examination.

On gross examination, it was an elliptical tissue piece partly covered with skin measuring 1.8 x 1.7 x 1.5 cms. Cut section showed a tiny cyst surrounded by pale, fibrous tissue. Center of the cyst showed a curled, white structure. Microscopically, there was a cyst with a coiled parasite. The cyst was surrounded by dense fibrous wall and showed prominent investing cuticle with presence of single degenerating sucker, aggregated subcuticular cells, smooth muscle fibres inflammation, presence of calcospherules and fragments of wall. The final diagnosis of Subcutaneous Cysticercosis was made based on the histopathological findings.

DISCUSSION: Humans are the only definitive host and harbour the adult tapeworm. Humans can also act as intermediate hosts by ingestion of food contaminated with *Taenia solium* eggs. Airborne transmissions of *Taenia solium* eggs and autoinfection by regurgitation of proglottids into the stomach of patients with taeniasis have not yet been demonstrated as routes of infection. Therefore, cysticercosis in humans is almost always caused by cysticercosis cellulose and results due to infection with eggs of *taenia solium*. [2] *Taenia solium* infestation is rampant in many parts of the world, including Russia, China, India, Mexico, Philippines, Pakistan and Nepal. [3] Widespread dissemination of cysticerci throughout the human body was reported as early as 1912 by British Army medical officers stationed in India [4]. Priest, in 1926, described probably the first case of extensive somatic dissemination of *C. cellulosae* in a British soldier who had swelling of his muscles, epileptic seizures, mental dullness and widespread subcutaneous nodules [5].

CONCLUSION: Even though Cysticercosis is common in brain and skeletal muscle, it is rare at subcutaneous location. Therefore the possibility of Cysticercosis should be considered in the differential diagnosis of subcutaneous swelling in the adult age group. A preoperative diagnostic suspicion of cysticercosis is important in patients with cystic lesions because specific drug treatment is available. Treatment with anti-helminthics, particularly albendazole, should be considered in patients before surgery.

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CASE REPORT & REVIEW ARTICLE

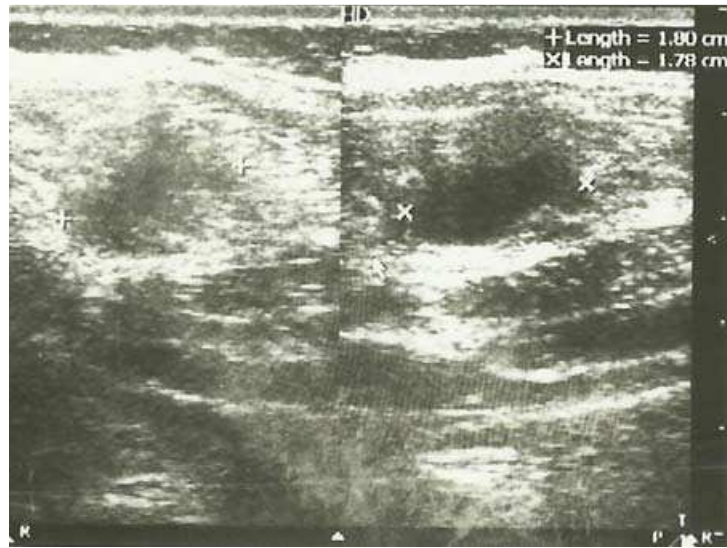


Fig:1 and 2, USG Abdomen, Right parietal wall showing Irregular heterogeneous partly cystic lesion deep to subcutaneous tissue and superficial/within external oblique aponeurosis.

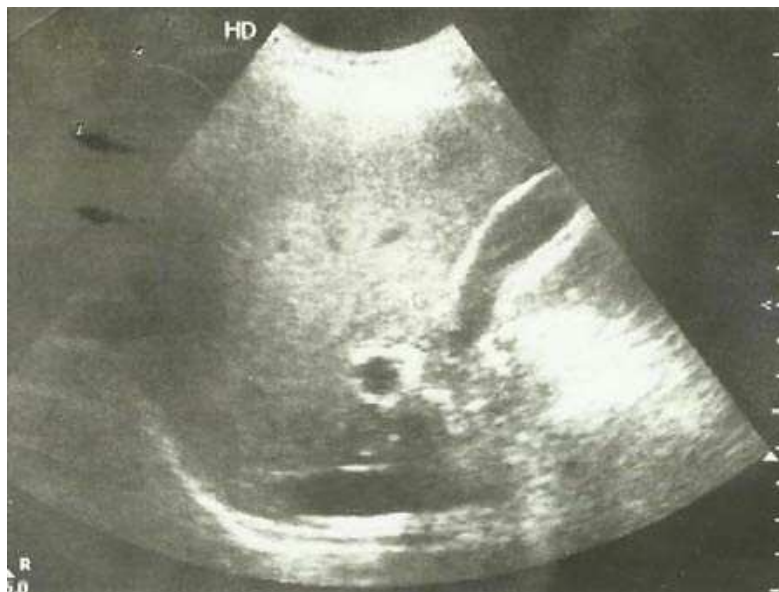


Fig- 2



Fig:3- **Cysticercosis cellulose**, larval stage with degenerating sucker (H & E stained section x 400)

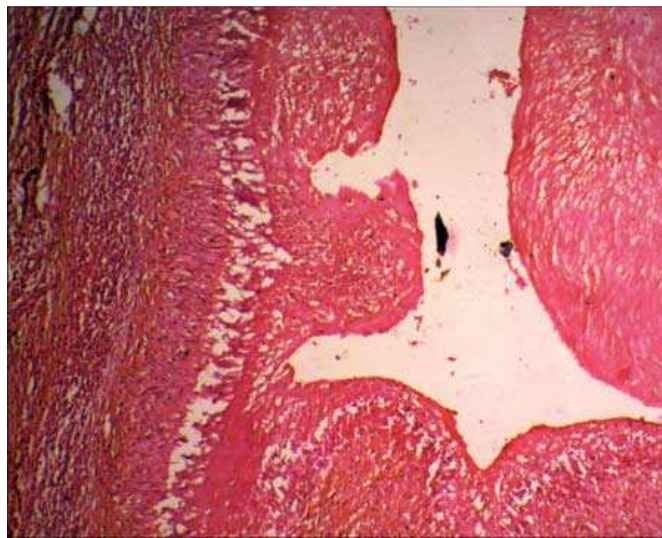


Fig:4, **Cysticercosis cellulose**, larval stage showing degenerating sucker with surrounding inflammatory reaction consisting of eosinophils, lymphocytes & plasma cells –Arrow top panel at left (H & E stained section x 400)

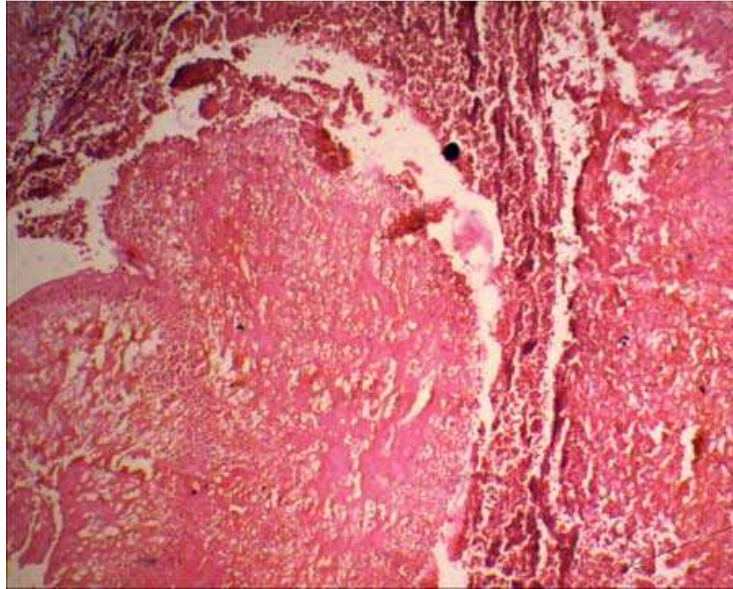


Fig:5 Cysticercosis cellulose, showing degenerating larva with surrounding intense inflammatory reaction with eosinophilic prominence, arrow bottom panel at right (H & E stained section x 400)

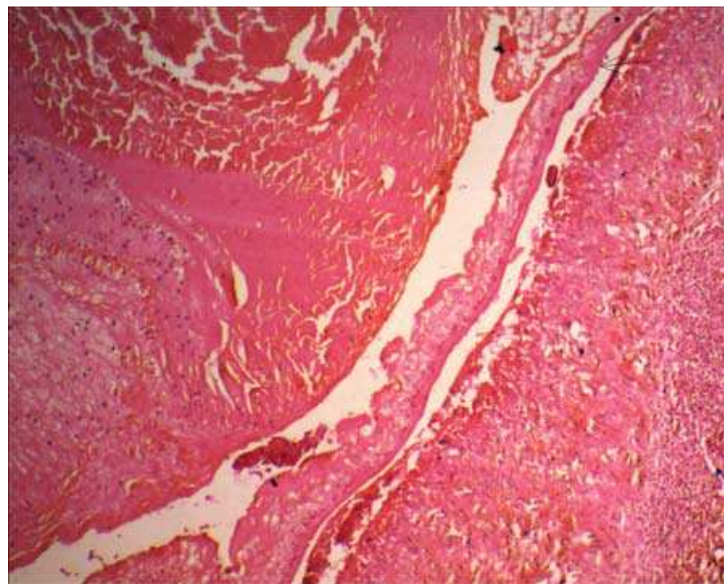


Fig: 6, Cysticercosis cellulose, larva with fragments of wall, arrow upper panel at right (H & E stained section x 400)

CASE REPORT

PLASMACYTOMA OF MANDIBLE: A CASE REPORT.

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ABSTRACT: BACKGROUND AND AIM: Extramedullary Plasmacytomas (EMP) are rare tumors accounting for 0.4% of all head and neck malignancies. The patients ranged from 34 to 76 years, there was a marked preponderance of males. Chronic, non-painful swelling of the posterior portion of mandible with is the commonest symptom. Monoclonal immunoglobulin was initially detected in 42% of the evaluated patients. The majority of patients were treated with radiation therapy. 17% of the patients progressed to multiple myeloma within 1 year.

A 60 yr old male, chronic tobacco sniffer presented with swelling posterior end mandible. Radiography revealed a multilocular radiolucent lesion in the mandibular posterior region. Bone marrow aspiration revealed a plasma cell infiltrate of less than 3% of all nucleated cells. Microscopically the tumour shows mature, immature, typical, atypical, binucleate plasma cells in sheets. A histological diagnosis of plasmacytoma was made. **CONCLUSION:** We report a case of extramedullary plasmacytoma (EMP) of the mandible in a 60 year old male, who was a chronic tobacco sniffer. The case demonstrates the multidisciplinary approach required for the optimal diagnosis and management of such tumors and proposes chronic irritation as one of the etiological factors for EMP.

KEYWORDS: Plasma cell neoplasm, bone, solitary plasmacytoma, Multiple myeloma; plasmacytoma

INTRODUCTION: Extramedullary Plasmacytomas (EMP) are rare tumors accounting for 0.4% of all head and neck malignancies. Review of the literature disclosed the following characteristics regarding the clinical course and prognosis. The patients ages ranged from 34 to 76 years, with a mean of 53 years; there was a marked preponderance of males. The site of predilection was the posterior portion of the mandible. The common symptom was a non-painful swelling of the mandible of long duration, and radiological features were non-specific. Monoclonal immunoglobulin was initially detected in 42% of the evaluated patients. The majority of patients were treated with radiation therapy with a mean dose of 48Gy with or without surgery. The period of follow-up ranged from 4 months to 12 years, and 17% of the patients progressed to multiple myeloma within 1 year.

A plasmacytoma is a discrete, solitary mass of neoplastic monoclonal plasma cells in either bone or soft tissue (extramedullary). Solitary plasmacytomas can be divided into 2 groups according to location:

CASE REPORT

- Plasmacytoma of the skeletal system (SBP).
- Extramedullary Plasmacytoma (EMP)

DIAGNOSTIC CRITERIA FOR SOLITARY BONE PLASMACYTOMA (SBP) [1,2,6,8,9]

- Single area of bone destruction due to clonal plasma cells
- Bone Marrow Plasma Cell infiltration not exceeding 5% of all nucleated cells.
- Absence of osteolytic bone lesions or other tissue involvement (no evidence of myeloma)
- Absence of anemia, hypercalcemia, or renal impairment attributable to myeloma
- Low, if present, concentrations of serum or urine monoclonal protein
- Preserved levels of uninvolved immunoglobulins.

The present study was done as incidence of extramedullary plasmacytomas are very low and to compare the findings with that of others.

CASE DESCRIPTION: A 60-year-old male patient consulted with the primary complaint of slowly developed swelling in his mandible. Past history was not contributory. He was a chronic tobacco sniffer.

Clinical examination revealed a tender swelling at posterior angle of mandible measuring 5 x 3 x 1 cm.

Haematological laboratory findings revealed WBC as $6.5 \times 10^3/\mu\text{L}$, RBC $4.10 \times 10^5/\mu\text{L}$, HGB 7.9 g/dL, P 82 %, L 14 %, M 02 %, E 02 %. and ESR was 60 mm/h.

Routine blood tests and serum biochemistry including calcium, phosphorus, blood urea nitrogen, urea, uric acid and creatinine were all within reference range. Both serum myeloma proteins and urine Bence- Jones proteins were negative. Serum and urine electrophoresis did not reveal M component.

Bone marrow aspiration revealed a plasma cell infiltrate of less than 3% of all nucleated cells.

Radiography revealed a multilocular radiolucent lesion in the mandibular posterior region, which was ill-defined and caused deformation in cortical bone. There were no other bony changes in his skull radiograms. Chest radiograph, total body skeletal survey, showed no systemic lesion.

FNAC NOT DONE: Excision biopsy is done. Post operative the patient was asymptomatic. There is no history of recurrence.

The tumour tissue was received in form of multiple pieces of fibromuscular tissue along with irregular tumour mass which has ragged margin and gray white cut surface.

Microscopically the tumour shows mature, immature, typical, atypical, binucleate plasma cells in sheets. Areas of haemorrhage are also noted. Adjacent skeletal muscle is free of tumour infiltration. (Fig . 1)

A histological diagnosis of plasmacytoma was made.

DISCUSSION: SPB is tumor of plasma cells, which manifests itself as a single osteolytic lesion without plasmocytosis of bone marrow and constitutes approximately 3% of all plasma

CASE REPORT

containing tumors [1,2,9] SPB is more prevalent in males than females, the ratio being 2:1 [1,8,9]

The most common sites of SPB were long bones and vertebrae. It rarely involves jaws and when it was seen, only 4.4% of SPB occur in the mandible, most commonly in the bone marrow-rich areas of the body, angulus and ramus mandible [1,3, 9,10].

Most common clinical symptoms of SPB are pain in the jaws and teeth, paraesthesia, anesthesia, mobility and migration of the teeth, haemorrhage, swelling in hard and soft tissues and pathological fractures. [1, 8]

In our case, the lesion was located in the posterior part of the mandible. A study by Pisano et al [2] containing 13 cases of SPB, showed that nine lesions were located posterior to the premolars and only one case was anterior but distal to the canine. A study carried out by Marick et al [3] which consisted of 21 cases of SPB showed that in 15 cases, the lesion affected the maxilla more than the mandible and despite the reported female predominance in the literature, males were predominant. The male/female ratio was 2:1. In our case, swelling was the major symptom and pain was present but paraesthesia was not reported. Radiographically, SPB was seen as a well defined, unilocular or multilocular destructive lesion with lack of any sign of bone reaction [5,6,8,]. But in our case, only unilocular lesion was noted.

There is a possibility of transformation of SPB and EMP to MM. This possibility was higher in SPB than EMP. Clinical investigations conclude that 35–85% of SPB cases were transformed to MM in a period of couple of months to a few years. But it is not possible to predict which case may transform, so after treatment, SPB cases must be followed up with routine laboratory monitoring of immunoglobulins and monoclonal proteins in serum and Bence-Jones proteins in urine In our case, when the patient first consulted our clinic for the jaw lesion, bone marrow examination results were normal.

Plasma cell neoplasms appear as sheets of plasma cells and are indistinguishable histologically. Clinical signs were also the same. Distinguishing one from the other was critical to treatment and survival. According to the description of dysplastic behaviour of plasmacytoma by Sukpaninchnant et al [6] minimal dysplasia was defined as most of the plasma cells being mature and plasmoblasts (cells with nucleoli) accounting for less than 10% of cells, whereas marked dysplasia was defined as plasmoblasts consisting of greater than 50% of tumour cells. Our case was judged as minimal dysplastic as the histopathological results indicated mature plasma cells. The course of SPB was relatively benign. Nevertheless, prognosis of SPB is poorer than EMP; 58% of cases progress to MM and survival at 10 years is 16% in SPB[5,6,7,8,]). The average outliving is over 90 months.

CONCLUSION: In present case a 60 yr old male chronic tobacco sniffer presented with swelling in the mandible. On laboratory and radiological investigations , biopsy was done which showed sheets of mature immature plasma cells. Bone marrow aspiration showed plasma cells 3 % .So the diagnosis of extramedullary plasmacytoma was done.

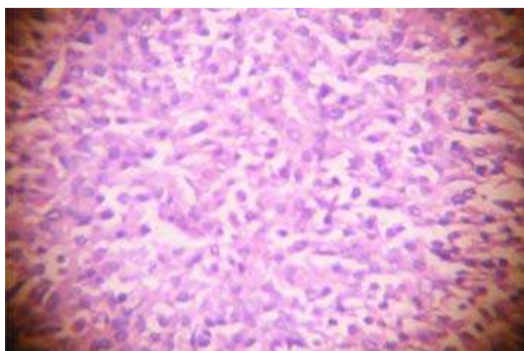
The course was relatively benign, however some cases may progress to multiple myeloma. The case demonstrates the multidisciplinary approach required for the optimal diagnosis and management of such tumors.

CASE REPORT

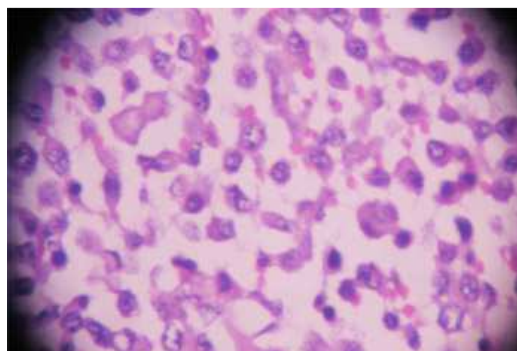
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LOW POWER VIEW :
Sheets of plasma cells



HIGH POWER VIEW : Sheets of mature, immature and binucleate plasma cell



CASE REPORT

INFANTILE HEMANGIOENDOTHELIOMA OF THE SUBMANDIBULAR GLAND – A CASE REPORT

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ABSTRACT: Infantile hemangioendothelioma is a benign neoplasm of the salivary gland .The lesion is comprised of round to oval cells with few spindle cells arranged in vascular channels .We present a case of 15 month old female child with swelling in the submandibular region . Radiologically the lesion was found to be of submandibular gland origin .Fine needle aspiration yielded only blood elements .Excision was done and histology showed morphology of Infantile hemangioendothelioma. Infantile hemangioendothelioma of salivary glands was reported in parotid gland, but its occurrence in the submandibular gland has not been reported till now to the best of our knowledge.

KEY WORDS: Submandibular gland, Infantile hemangioendothelioma, benign neoplasm

Salivary gland neoplasms are rare. They constitute to 3% of the head and neck tumors(1).The incidence of neoplasms is high in parotid gland when compared to the Submandibular salivary gland(2).In children congenital malformations of the salivary glands are more common than neoplasms. Most of the benign neoplasms in this age group are of vascular origin. These lesions regress progressively and hence surgical intervention should be selective and appropriate.

CLINICAL HISTORY: A 15 months old female child presented to the department of paediatric surgery with a swelling in the submandibular region on right side. This swelling was informed to be noticed one month back .It was gradually increasing in size and was not associated with pain .There was no history of trauma. Clinical examination revealed a swelling of about 3x3cm,nontender ,well defined margins and skin over the swelling was normal .The child was then sent to radiology department for X-ray and ultrasonography. Both confirmed the lesion to be of Submandibular gland origin .Ultrasound showed that lesion was solid with high vascularity and a provisional diagnosis of neoplasm was given. Then the swelling was subjected to FNAC. But repeated aspirations yielded only blood elements. The subject was then observed for another one month and the swelling was found to increase in size. Then excision was done and specimen was sent to the laboratory for histopathological examination. Clinical photograph of the case was not available as the lesion was already excised before we could diagnose it.

CASE REPORT

PATHOLOGICAL EXAMINATION: Gross findings: We received a single gray brown soft tissue mass measuring 2x2x1cm. Cut section showed solid gray brown tissue with areas of hemorrhage.

Tissue bits were taken and subjected to routine processing. Sections were taken for routine H&E staining and Immunohistochemistry

MICROSCOPY: Section studied revealed normal salivary gland tissue along with a partially encapsulated lesion comprised of round to oval cells in solid sheets at places surrounding vascular spaces with inconspicuous lumina. These cells are more or less uniform with scant to moderate amount of cytoplasm and vesicular nucleus. At places the acini and ducts were seen entrapped within the lesion. No evidence of mitotic activity or atypia.

DISCUSSION: Salivary gland neoplasms are uncommon in children. The spectrum of tumors of salivary gland in infancy and childhood are distinctive(3). The incidence of benign and malignant neoplasms in children is debatable(4). However most of the studies have shown that malignant tumors are rare in children when compared to benign(5). In children parotid gland is mostly involved(6). Pleomorphic adenoma is the most common neoplasm in children and adolescents(7).

Vascular lesions of salivary gland are frequently encountered in children. Clinically these entities present as painless masses. In this age group vascular neoplasms have to be differentiated from vascular malformations (8). Some authors have subclassified Hemangiomas as Usual hemangiomas and juvenile or capillary hemangiomas by some authors (9). These are more common in females(3). Infantile hemangioendothelioma is usually a benign vascular lesion but occurrence of malignant sarcomas have been reported(7,8,9). Some authors have labelled capillary hemangioma in infants as Infantile hemangioendothelioma. Other synonyms of this lesion are cellular hemangioma of infancy, straw berry nevus, Juvenile hemangioma and Immature capillary hemangioma. This lesion can occur in any organ but commonest sites are skin, and soft tissue. It can also present as abdominal mass or liver mass.

Hemangiomas constitute 0.4% of the salivary glands tumors and they are more common in parotid gland. The occurrence of Infantile hemangioendothelioma in submandibular gland is extremely rare and this makes our case more remarkable. Grossly these lesions can be solitary or multicentric. Histopathological sections show capillary like small proliferating vessels in major portion of the lesion. The lining cells are plump, occasionally epithelioid like with pericytes. Occasionally mitotic figures can be noted along with hypovascular stroma, central necrosis and calcification. Perineural invasion is rare but when present does not denote the malignant behaviour of the tumor. Differential diagnosis includes capillary hemangioma, Infantile Angiosarcoma and rarely angiosarcoma when mitotic figures are high.

FNAC and CT scan were found to have immense utility in diagnosis of these lesions(13). However in our case FNAC yielded only blood. Reticulin stain is also useful in differentiating these lesions from other members. Immunohistochemistry is of great use in the diagnosis of these tumors. Vascular markers like factor vIII and CD 34 are strongly positive. A single endothelial marker, GLUT-1, is now available. This immunophenotype is present in all cases of infantile haemangioma at every stage and is negative in other tumors(14). Recent studies have shown that Prox1 transcription factor acts as a marker to differentiate hemangioendotheliomas.

CASE REPORT

CONCLUSION: Infantile hemangioendothelioma of Submandibular gland is extremely rare and has to be differentiated from other similar vascular lesions .These neoplasms are known to regress over a period of time .Hence surgical management in these cases should be precise .A definite diagnosis and appropriate management is mandatory while treating a case of salivary gland tumor in children.

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CASE REPORT



Fig - 1

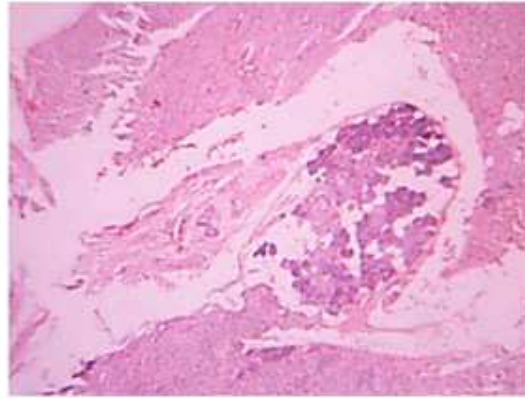


Fig 2

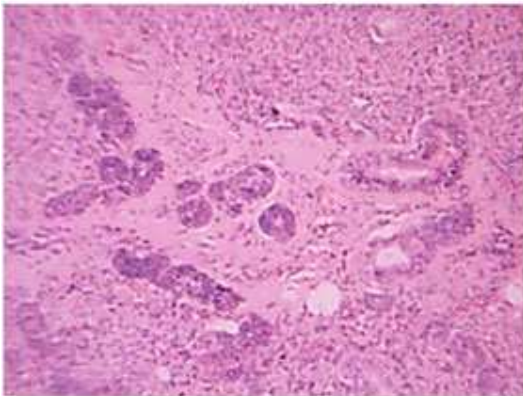


Fig - 3

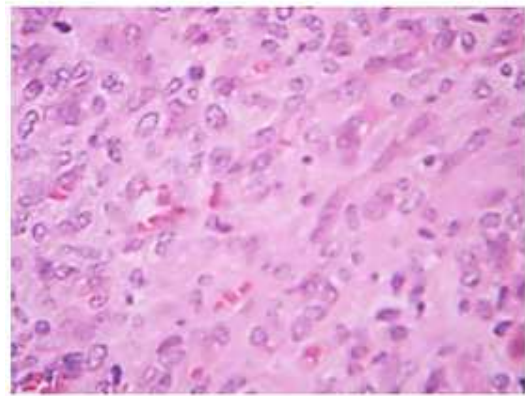


Fig 4 FactorvIII

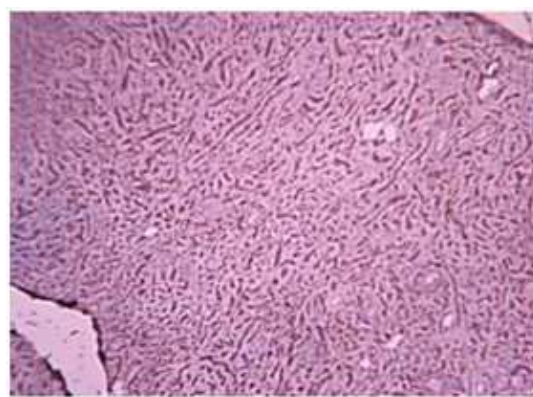
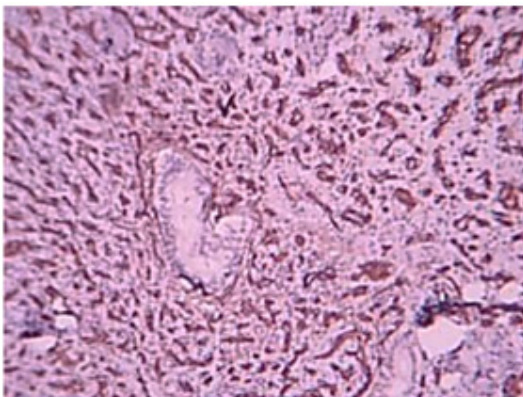


Fig 5 Immunohistochemistry: The tumor showed strong positivity for CD34 and Factor VIII antigen. The entrapped glands remained unstained.

COMPARATIVE EVALUATION OF A MIXTURE OF ATRACURIUM AND TRAMADOL OR KETOROLAC AS AN ADJUNCT TO LOW DOSE LIGNOCAINE IN INTRAVENOUS REGIONAL ANESTHESIA

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ABSTRACT: BACKGROUND: Purpose of the study was to evaluate the efficacy of Atracurium as adjuvant with tramadol or Ketorolac in reducing the dose of lignocaine used for intravenous regional anesthesia thereby decreasing the chances of systemic toxicity of lignocaine.

PATIENTS AND METHODS: Sixty adult patients of ASA grade I and II were divided into three equal groups of twenty each in randomized double blind manner. Group I patients received 40ml of 0.5% lignocaine. Group II and III received 40 ml of 0.25% lignocaine with addition of 2 mg Atracurium and 50 mg tramadol while in Group III, tramadol was replaced with 30 mg of Ketorolac. Onset of sensory and motor block, intraoperative degree of analgesia, intraoperative and postoperative complications were recorded in all the three groups. **RESULTS:** There was no significant difference between the groups with respect to age, weight and sex distribution. Mean time of onset of motor block in group I, II and III was 4.15+0.81, 11.7+0.86 and 14.2+0.69 minutes respectively which was statistically significant ($p < 0.001$). Mean time of onset of sensory block in groups I, II and III was 2.95+0.82, 8.75+1.20 and 11.05+1.04 minutes respectively which was also statistically significant. Intraoperative degree of analgesia in group II and III was comparable to group I. **CONCLUSIONS:** The use of 0.25% lignocaine and Atracurium with tramadol or Ketorolac provides comparable analgesia to 0.5% lignocaine used alone. This decreases the concentration and total dose of lignocaine required but delays the onset of both sensory and motor block.

KEYWORDS: Intravenous regional anesthesia, Lignocaine, Ketorolac, Tramadol, Atracurium, IVRA.

INTRODUCTION: The terms "Regional Anesthesia" was coined in 1902 by Harvey Cushing for his technique of blocking either brachial or sciatic plexus under direct vision during general anesthesia to reduce anesthesia requirements and provide post operative pain relief. Intravenous regional anesthesia was first described in 1908 by August Gustav Bier, but his technique never gained much popularity¹. The credit for re-introducing intravenous regional anesthesia goes to Machinnon Holmes in 1963².

ORIGINAL ARTICLE

Intravenous regional anesthesia is a practical form of anesthesia for short surgical procedures requiring inexpensive equipment, little preparation and minimal technical skills. Being a regional technique it avoids all the complications of general anesthesia, more so in patients coming for emergency surgery as well as patients belonging to ASA class III or IV.

Most important complications in intravenous regional anesthesia are due to the toxicity of the local anaesthetic and will occur if the tourniquet suddenly deflates soon after the local anaesthetic has been injected³. Lignocaine in the dose of 1-2 mg/kg intravenously is safe and effective for treating ventricular arrhythmias⁴ or attenuating the cardiovascular response to endotracheal intubation⁵. To have a good and prolonged analgesia with the same strength of lignocaine, different methods have been proposed like alkalization of local anaesthetics⁶, addition of an opioid⁷, muscle relaxant or a NSAID⁹.

AIM OF STUDY: To evaluate the efficacy of adding Atracurium with tramadol or ketorolac when lignocaine concentration is reduced to 0.25% from conventional 0.5% used for intravenous regional anesthesia.

PATIENTS AND METHODS: After obtaining informed consent and approval from the local ethics committee, this study was conducted in 60 ASA I and II patients with age group 20-60 yrs of either sex, scheduled for elective surgery on forearm and hand.

Patients treated with opioids, patients with acid peptic disorder, coagulation disorder, patients with hypersensitivity to LA and NSAID's were excluded from the study. These sixty patients were randomly divided into 3 equal groups using computer generated random number list so as to receive one of the following solutions in a double blind fashion.

Group I – 40 ml of 0.5% lignocaine (200 mg)

Group II – 0.25% lignocaine (100 mg) + 50 mg Tramadol + 2 mg Atracurium diluted in normal saline to make total volume of 40 ml

Group III – 0.25% lignocaine (100 mg) + 30 mg Ketorolac + 2 mg Atracurium diluted in normal saline to make total volume of 40 ml

PREANESTHETIC PREPARATION: All the patients were kept nil per oral for about eight hours and were pre-medicated with Tab. Midazolam 7.5 mg at bed time and in the morning of surgery. Baseline records for B.P., R.R., SPO² and Pulse rate were noted.

ANAESTHETIC TECHNIQUE: In the operation theatre one intravenous line was set up in the non-operative limb. In the operative limb, a 22G intravenous cannula was inserted in the most distal vein. Patient was then shifted to operating table and was connected to the non-invasive monitors for getting continuous record of E.C.G, B.P. and SPO². A double tourniquet was positioned on the upper operative arm with the purpose of eliminating the tourniquet pain and patient comfort. Exsanguination of the limb was done by application of esmarch bandage. In case of painful limb where exsanguinations could not be carried out, limb elevation was given for five minutes. Proximal tourniquet was inflated 100 mmHg above the systolic B.P. of patient. 40 ml of study drug was then given over a period of 1 minute. Once the patient felt uneasiness at proximal tourniquet site or after twenty minutes, whichever was later the distal tourniquet was inflated to the same pressure and the proximal cuff was deflated. The surgery was allowed to proceed once the block was complete. In case of incomplete or partial block, supplemental GA

was given and the tourniquet was released only after 40 minutes and the patient was excluded from the study.

Onset of sensory block²¹ was assessed by response to pinprick at 1 minute interval

0 - Sharp

1 - Touch only

2 - Cannot feel touch

Score 2 was taken as onset of complete sensory block.

Onset of motor block²¹ – The motor block was assessed according to following scale:

0 - able to move arm against resistance

1 - Inability to move wrist against resistance

2 - Inability to move wrist and elbow against resistance

3 - Inability to move the arm against resistance

Score 3 was taken as onset of complete motor block.

Intraoperative degree of analgesia was evaluated by VAS on 0-10 cm scale. Complications if any were reported intra and postoperatively.

STATISTICAL ANALYSIS: Statistical analysis was done using ANOVA test. Intergroup comparison was done with Bonferroni's T – test in which the critical value was 2.64.

RESULTS: All the three groups were comparable regarding their demographic data (age, sex and weight). Tendon repair was most commonly performed operation (23) followed by open reduction and nailing (15), implant removal (10) Nerve exploration (7) and contracture release (5).

Figure 1 shows the mean time of onset of sensory block in group I, II and III. There was statistically significant difference between group I & II, group I & III and group II & III in the mean time of onset of sensory block. Figure 2 shows the mean time of onset of motor block in group I, II and III. There was statistically significant difference between group I & II, group I & III and group II & III in the mean time of onset of motor block. Both the onset of sensory and motor block was delayed in group II and III as compared to group I (t – stat > 2.64)

Figure 3 shows the VAS score at 10 min, 20 min, 30 min, 40 min, and 50 min in Group I, II and III. Statistically the difference in VAS score in these three groups using ANOVA test was found to be significant (P < 0.001). Statistically the difference in VAS was found insignificant between group I & II at 10, 20, 30, 40 and 50 min (t-stat < 2.64). In group I and III and group II and III the difference in VAS score at 10, 20, 30, 40 and 50 min was found to be statistically significant (t-stat > 2.64).

Two patients in group I experienced dizziness post operatively after release of tourniquet. Two patients in group II had skin rash distal to the tourniquet which faded half an hour after release of tourniquet. Three patients had to be supplemented with general anesthesia and were excluded from the study.

DISCUSSION: Intravenous regional anesthesia technique was first described by August Bier in 1908. He injected Procaine into a superficial vein of a limb previously rendered bloodless by a tourniquet. After a period of wide popularity, it fell into disuse until repopularized by Holmes in 1963 who substituted lignocaine for procaine. Different anaesthetic agents including procaine,

lignocaine, prilocaine, bupivacaine and mepivacaine have been used for intravenous regional anesthesia. Lignocaine is the local anesthetic most commonly chosen for this technique¹⁰. Lignocaine 3 mg/kg administered as 0.5% solution ensures adequate analgesia and relaxation when used for upper limb surgery. However this much dose of lignocaine has been reported to cause toxic reactions including convulsions, coma, cardiorespiratory depression and even¹¹ cardiac arrest.

Toxicity may be due to leakage past the tourniquet after injection caused by either tourniquet failure or build-up of excessively high venous pressure distal to the tourniquet¹². Lignocaine in a dose of 1-2 mg/kg has been found to be safe and effective for treating ventricular arrhythmias or attenuating the cardiovascular response to endotracheal intubation. But this much dose has been found to produce insufficient analgesia when used in intravenous regional anesthesia¹³.

To potentiate the effect of low dose lignocaine (0.25%) used in intravenous regional anesthesia, various drugs have been added like opioids, muscle relaxants or NSAIDs.

Torda and Klonymus were the first to use muscle relaxants after application of a tourniquet on an extremity to avoid use of high doses of neuromuscular blocking¹⁴ drugs and deep planes of anesthesia. Elhakim et al reported that both local anesthesia and muscle relaxants exert an effect at the neuromuscular junction¹⁵. In addition muscle relaxants probably interfere with muscle tone and spasm. The spindle is the sensory end organ of skeletal muscle sending information about fiber length to the brain. Loss of tone and spasm may improve both intraoperative pain and operating conditions.

Opioids have been used in intravenous regional anesthesia either as sole adjunct or in combination with muscle relaxants¹⁶, peripheral opioid receptor¹⁷ or by a local anaesthetic action of their own¹⁸. It has been suggested that previously inactive neuronal opioid receptors may become active in painful inflammatory conditions resulting in reduced neural excitability, inhibited propagation of action potentials and the release of excitatory, pro inflammatory neuropeptides.

Tramadol, a synthetic opioid analgesic produces anti-nociception via an opioid (predominantly μ) mechanism and also via a separate non-opioid mechanism (probably related to its ability to inhibit neuronal uptake of nor-epinephrine or serotonin¹⁹).

Vaos et. al was the first to use Ketorolac with intravenous regional anesthesia in the management of patients with sympathetically mediated pain²⁰. They reported prolonged pain relief in seven patients who were administered intravenous regional anesthesia with Ketorolac. The idea of using NSAID's during intravenous regional anesthesia originated from the facts that tissue ischemia following tourniquet inflation may lead to the release of inflammatory mediators which could be prevented by anti-inflammatory drugs.

In our study the mean time of onset of sensory and motor block was delayed in group II and III as compared to group I. Our findings are comparable with Palecha²¹ et al (2001) who observed that mean time of onset of sensory and motor block was delayed in group containing 0.25% lignocaine with pentazocine and pancuronium as compared to the group containing 0.5% lignocaine.

Statistically the difference in VAS was found insignificant between group I and II at 10, 20, 30, 40 and 50 minutes. Our finding is comparable to the observations made by Sztark et al who found that adding on opioid and muscle relaxant to 0.25% lignocaine reduced the dose of lignocaine to non-toxic level for the same quality of analgesia as provided by the use of 0.5% lignocaine in intravenous regional anesthesia.

ORIGINAL ARTICLE

Statistically the difference in VAS score was significant between group I and III and group II and III (t-stat > 2.64). This is in contrary to the finding of Reuben²² et al who found that addition of 60 mg of Ketorolac of 0.5% lignocaine for intravenous regional anesthesia provided better intra-operative analgesia. Reason for getting a better outcome in intravenous regional anesthesia in this study could be use of high concentration (0.5%) of local anaesthetic combined with high dose of Ketorolac (60mg) as compared to low conc. of lignocaine (0.25%) and low dosage of Ketorolac (30mg) used in our study.

Thus the addition of tramadol and Atracurium to 0.25% lignocaine provides the same quality of intraoperative analgesia as compared to 0.5% lignocaine but the combination had delayed onset of sensory and motor block. Addition of Ketorolac 30 mg and 2 mg Atracurium to 0.25% lignocaine does not provide the same quality of analgesia as compared to 0.5% lignocaine although it provides clinically acceptable surgical anaesthesia. So the use of 0.25% lignocaine with these adjuncts allows a reduction in total dose of lignocaine while achieving the same degree of intraoperative analgesia in intravenous regional anesthesia.

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Table 1 – Comparison of demographic profile of patients

	Age Mean (yrs)	Sex		Weight (kg)
		Male	Female	
Group 1	33.35 + 4.69	4	16	55.7 + 3.65
Group 2	31.95 + 6.71	4	16	56.7 + 3.32
Group 3	33.05 + 6.09	5	15	56.75 + 3.24

Table 2 – Comparison of surgical procedures and duration of surgery

Surgical Procedures	Group I	Group II	Group III
Tendon repair	8	7	8
Open reduction and nailing (Hand and finger)	5	6	4
Implant removal	3	4	3
Contracture release	1	2	2
Nerve exploration	3	1	3
Duration of surgery in minutes.	46.3 + 7.29	44.3 + 4.41	43.65 + 4.34

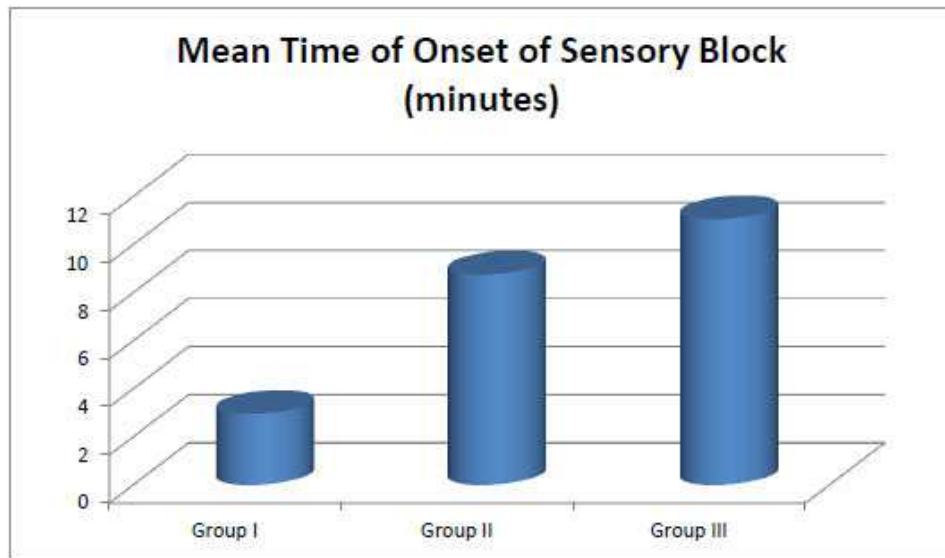


Figure 1

Inter Group Comparison & Statistical Significance of the Mean Time of Onset of Sensory Block

Group	't' statistics	Inference
I-II	17.68	S
II-III	07.01	S
I-III	24.69	S

Critical Value = 2.64 > 2.64- Significant (S) < 2.64- Non Significant (NS)

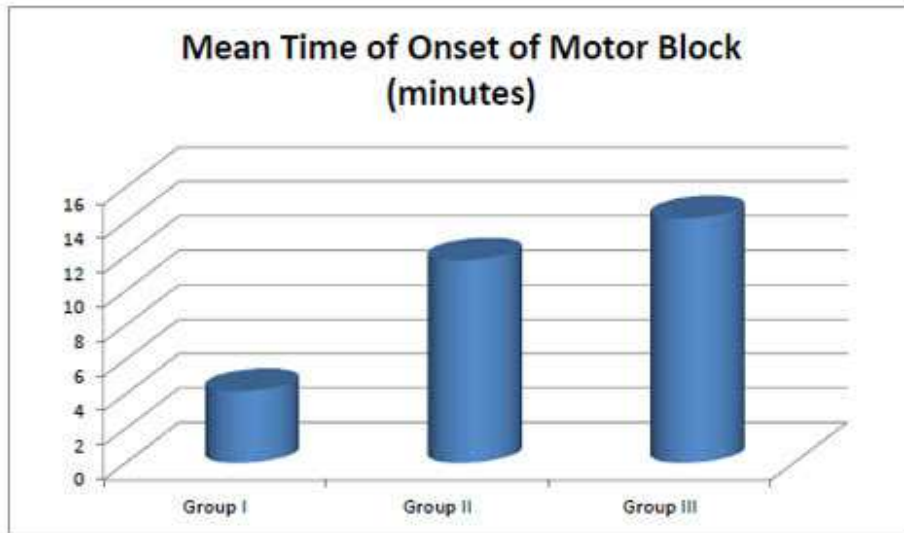


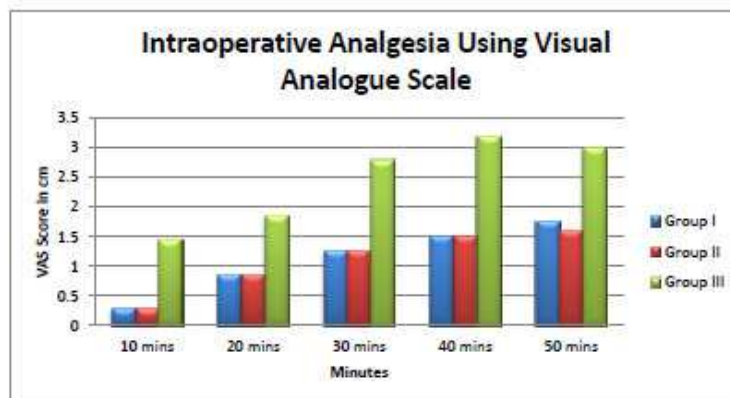
Figure 2

Inter Group Comparison & Statistical Significance of the Mean Time of Onset of Motor Block

Group	't' statistics	Inference
I-II	30.07	S
II-III	09.96	S
I-III	24.69	S

Critical Value = 2.64 > 2.64- Significant (S) < 2.64- Non Significant (NS)

Figure 3 - Intraoperative analgesia by visual analogue scale (0-10 cm)



CASE REPORT

ERYTHEMA NODOSUM LEPROSUM- A CASE REPORT.

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ABSTRACT: Leprosy is an ancient disease that has survived into the modern ages despite an intense effort to eliminate it worldwide.^[1] Here we report a case of recurrent, multiple ulcerative lesions with pitting edema of both lower extremities, in a 62 years old male. He was a diagnosed case of Hansen's disease with irregular treatment since 2 years. All biochemical parameters were within normal limits. Rheumatoid factor, ANA, ELISA for HIV and VDRL were negative. Modified ZN staining (using 5% sulphuric acid) shows acid fast bacilli (grading +++), arranged in globi, 65% were fragmented & 35% were uniformly stained. Organisms isolated in bacterial culture were *Proteus mirabilis* & *Staphylococcus aureus* & *Candida* spp isolated in fungal culture. Patient was admitted and was started on MDT-MB along with prednisolone.

KEY-WORDS: Erythema nodosum leprosum, *Mycobacterium leprae*, Modified ZN stain

INTRODUCTION: Leprosy is an ancient infectious disease caused by *Mycobacterium leprae* that affects the skin and peripheral nerves. A wide clinical spectrum of disease exists, from the tuberculoid pole [associated with a vigorous Th1 response, relatively few bacilli, and limited well-defined lesions] to the lepromatous pole [associated with aggressive Th2 response, many bacilli, and diffuse symmetric lesions].^[2] Though it is a chronic disease, it has tendency for debilitating acute exacerbations termed reactions; Type 1 Reaction [Reversal Reaction] and Type 2 Reaction [Erythema Nodosum Leprosum (ENL)].^[1] Erythema nodosum leprosum, is an acute inflammatory reaction seen in patients with lepromatous leprosy or occasionally in borderline lepromatous leprosy.^[3] Though it is usually seen during the course of treatment it may occur in previously untreated patients as well.^[4] The lesions are erythematous painful tender papules and nodules. In mild reaction nodules are small in number and spontaneously resolve leaving behind hyperpigmented macules.^[5] In severe reactions, nodules tend to increase in size and ulcerate. Vesiculobullous, pustular, ulcerated, and hemorrhagic and erythema multiforme-like lesions have been reported in ENL.^[6] In this article, we have discussed a case which presented to us with recurrent, multiple ulcerative lesions with pitting edema of both lower extremities. The case was admitted in our hospital, Pradumna Bal Memorial Hospital, KIMS, Bhubaneswar, where he was investigated, diagnosed and started on treatment.

CASE REPORT: A 62 year old male was presented with multiple painful ulcerated skin lesions over both the lower extremities and gluteal areas of 3 months duration. He had history of recurrent attacks of papulo-pustular lesions, and ulcerations since two years. The skin lesion

CASE REPORT

first started over the gluteal region and slowly developed over the other sites. Current episode was most severe one and associated with low grade and intermittent fever.

On examination, he had multiple subcutaneous, erythematous blanching nodules on both the lower extremities and gluteal areas. A few nodules were crusted with serosanguinous discharge [Fig.1]. There were no other patches, plaques or nodules in other part of the body. There was associated pitting edema & loss of temperature sensation of lower extremities. Haematological investigations showed Hb-10gm%, TLC-12000/mm³ with 70% of neutrophils, ESR showed 30mm in the 1st hour, FBS- 90mg%. Urine analysis and all other biochemical parameters were within normal limits. Rheumatoid factor, ANA, HBsAg, HIV and VDRL were negative. Bacterial culture of pus showed growth of *Staphylococcus aureus* and *Proteus mirabilis* and *Candida* spp isolated in fungal culture. Modified ZN staining (using 5% sulphuric acid) of pus shows acid fast bacilli (grading +++), arranged in globi, 65% were fragmented & 35% were uniformly stained. Skin biopsy showed atrophic epidermis, few foamy macrophages with small aggregates of neutrophils in the dermis and oedematous dermal vessels.

The patient was diagnosed as a case of lepromatous leprosy with type 2 reaction [ENL]. Patient was started on MDT MB along with prednisolone 40 mg/day (with the plan to be tapered and stopped over 3 months period). At subsequent follow-up, patient's condition was better with healing of all the lesions.

DISCUSSION: Leprosy is a unique disease with a peculiarly long incubation period, a wide spectrum of clinical presentations related to host immunity and acute exacerbations termed reactions.^[1]

Type 2 reaction or ENL occurs in patients having high load of leprosy bacilli (50% cases of lepromatous leprosy and 25% of borderline lepromatous leprosy).^[3] It can occur in the early stages of treatment and even after completion of the treatment with MDT, commonly within first three years after the start of treatment. However, 10% cases have been reported even before starting treatment or as the first clinical manifestation of leprosy.^[4] It is a multisystem disorder involving skin, peripheral nerves, and sometimes, the internal organs. It presents in the skin as crops of painful or tender, erythematous, cutaneous and subcutaneous nodules concentrated on the extremities.^[1] They appear preferentially on cooler parts of the skin (face and outer surface of limbs and less frequently on the trunk) and usually spare the warmer parts. Rarely they can break down and suppurate / necrose producing Erythema Nodosum Necroticans (ulcerative ENL). The condition is often accompanied by fever, neuritis, and inflammation of internal organs in varying degrees. Individual patients may have a single bout of ENL or chronic recurrent manifestations.

The pathogenesis of ENL involves immune complex deposition and dysfunction of cell mediated immunity. Activation of complement and migration of neutrophils with release of tissue damaging enzymes, including IL-12 and TNF- α are important factors in the evolution of the disease. Such patients have poor cellular immunity to *M. leprae*, abundant bacilli in cutaneous and peripheral nerves, and a strong polyclonal antibody response with high levels of circulating immunoglobulins.^[7]

As immune complex deposition & defective CMI are the main cause in pathogenesis of ENL, immunosuppressants and TNF- α inhibitors have a role in treatment. Thalidomide and corticosteroids are the mainstays of treatment. Various other modalities of treatment are clofazimine, azathioprine, cyclosporine, methotrexate, antimony compound.^[7] Newer modalities

CASE REPORT

of treatment are IV Immunoglobulins, and the new non-steroidal anti-inflammatory drug, Tenidap.^[8]

Our case presents with multiple, painful ulcerated skin lesions over both the lower extremities and gluteal areas since 3 months and was on irregular treatment MB leprosy since 2 years. The case gets complicated by secondary bacterial and fungal infections due to delay in diagnosis. The case was interesting because ENL occurring after treatment with MDT-MB and presenting with extensive cutaneous ulceration is a very rare entity. But the diagnosis can be made on the basis of simple microscopy & culture which helps in patient's recovery by proper treatment and follow up.

So occurrence of tender, red, ulcerative nodules in leprosy patients on treatment should always prompt the treating physician to rule out ENL by simple clinical and laboratory tests. Early diagnosis & definitive treatment with glucocorticoid is essential to prevent secondary complications

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CASE REPORT

Fig.1: Multiple subcutaneous, erythematous blanching nodules on both the lower extremities.



DEVELOPMENT OF HUMAN MAMMARY GLAND - A PRENATAL STUDY.

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ABSTRACT: 44 fetuses of varying gestational ages, ranging from 33m.m C.R.L. to 270m.m.C.R.L. (i.e. from 8weeks to 32weeks of intrauterine life) were studied to note the developmental sequence of mammary gland. Tissues were prepared for microtomy by Paraffin wax embedding method. Serial sections were stained by Haematoxylin & Eosin (H & E) and Masson's Trichome method(1). It was observed that the organ is subject to fluctuations in its development. In the present study the primary bud, secondary bud, & tertiary bud formation is seen at 11th week, 14th week & 18th week of gestation respectively. The canalization appeared at 20th week of gestation. Variation is seen in the mode of canalization as well as in the time of start of canalization. In the present study an endeavour has been made to establish the time of appearance of mammary buds and their time of canalization. The observations are compared with the findings of other workers and discussed in the light of literature. Mammogenesis or development of mammary gland is of great importance for anatomists, surgeons, pathologists, physicians, obstetricians etc. A large number of developmental anomalies like amastia, athelia, polymastia, polythelia, etc are of interest to them which can be understood more if thorough understanding of development of mammary gland is there.

KEY WORDS: Mammary gland. Fetus. Mammogenesis.

INTRODUCTION: Mammary gland is a modified apocrine sweat gland and is a unique specialization of class Mammalia. It is as unique and complex as fingerprints. Despite its external presence, easy acceptability, and availability of effective screening procedures, diseases of breast are one of the common causes of morbidity and mortality in females.

With the advent of modern technology and equipment for diagnostic and therapeutic procedure in the field of medical science, it becomes imperative to have sound knowledge of developmental anatomy. Such is the importance of mammary gland that its absence is recorded in Bible(8:VIII) as the "Song of Solomon" as we have a little sister, and she hath no breast; what shall we do for our sister in the day she shall be spoken for?(2) Unlike most mammalian organs which develop embryonically with a more or less linear progression towards functional maturity, the mammary gland has a series of highly orchestrated transitions or switches & has both linear & cyclical growth phases(3). This gland develops by epithelio-mesenchymal interaction and the first distinction which must be made is the differentiation of presumptive mammary epithelium from tissues which would otherwise form skin, hair follicles, or other ectodermally derived structures. The development begins in the 6th week of intrauterine life as an ectodermal thickening called as Milk line on the ventral surface of fetus in Pectoral region.

ORIGINAL ARTICLE

Further development involves transition of Mammary line to Mammary crest, Mammary hillock & Mammary bud. The Mammary bud formation is a critical stage in development of mammary gland. (4) The time of appearance of various stages in the development of mammary gland vary. There is a variation in the mode of canalization. Also, many anomalies are reported in the development of breast due to drifting of cells to another area.

MATERIAL AND METHODS: The study was conducted on 44 fetuses of crown rump length (C.R.L) ranging from 33 mm C.R.L. to 270 mm C.R.L. Out of 44 fetuses collected 36 were female, 6 were male and sex of 2 fetuses could not be determined.(table-1) They were collected from the department of Gynaecology and Obstetrics of Govt Medical College Jammu and from Nursing homes in and around Jammu after the consent of parents following all ethical norms and clearances. None had any congenital malformation. Gestational age was determined according to crown Rump Length(C.R.L.)criterion as described by Hamilton Boyd and Mossman 1976(5).The breast bud and surrounding ellipse of nipple containing skin was excised along with underlying soft tissue. The tissue was fixed in 10% formal saline for 24 hrs. and then prepared for microtomy by the Paraffin wax embedding method Tissue blocks were serially sectioned to generate 7micrometer thick sections using a Rotary microtome The sections after mounting were stained with H & E & Massons Trichome stain.(1)

OBSERVATIONS: It was observed that there were individual variations in the development of mammary gland.

At 33mm C.R.L. there is a thickening of epithelium into a hillock which appears as a dome of ectodermal cells growing into the mesenchyme.

At 43-80mm C.R.L. Primary bud formation is seen. Primary bud is a spheroidal mass of epithelial cells connected by neck to overlying epithelium which consists of superficial periderm and deeper stratum germinativum resting on a definite basement membrane. Primary bud is surrounded by several concentric layers of fine collagen, fibroblasts and blood vessels with nucleated R.B.C.s (fig.1)

At 88mm-138mm C.R.L. Secondary budding is evident as the outline of the anlage is not regular. This is due to infolding of the basal membrane which gives the gland complex a rosette shaped appearance surrounding by concentric layers of collagen and interspersed fibroblasts. There is a gradual transition of compactness of fibrils and fibroblasts as we move to the periphery. Secondary buds have extended deep down to the dermis but not to the subcutaneous tissues (fig.2)

At 140-170mm C.R.L. Tertiary budding is seen which show a tendency to be present in groups There is rich vascularity in surrounding connective tissue which contains fibroblasts, collagen fibres and preadipocytes.

At 180-200mm C.R.L. Evidence of canalization is seen in the form of clear spaces or cavities at various places in the anlage. The lumina is better developed in terminal ducts(fig.3).The canalized ducts are lined by two layers of cuboidal epithelial cells.

At 206-270mm C.R.L. Canalisation is well marked and is seen at both the ends of anlage. The picture is like the histological picture of inactive adult mammary gland. The ducts seen are from different orders of branching of main ducts. Each duct is surrounded by a tissue of relatively cellular connective tissue about as thick as the duct is wide. The cellular connective tissue which surrounds the individual duct is confluent with each other. The ducts are lined by two layers of epithelial cells and bear a lumen to show presence of canalization. The mammary pit is seen on

the surface (fig.4) .

DISCUSSION: The present study illustrates a sequential view of human mammary gland development under light microscopy Differentiation of nipple was seen at 8th week of gestation. This was in accordance with Anderson R.R.(2000)(6) and Williams P.L.(2000)(7) . The thickening of the epidermal cells in the form of hillock was seen in fetus of 33mm C.R.L. The same stage was described by Turner(1952)(8) as mammary crest. Rugh (1968)(9)designated this stage as the 1st recognizable stage in the mouse and called it Mammary welts .A well developed mammary bud was seen at 17mmC.R.L.(11TH week) which was a typical bulb shaped primary bud as proposed by Lewis M.T.(2000)(3). Authors like Revis Don Jr.(2003)(10)and Valdes M.A.(1979)(11) have found it at 7th and 9th week of gestation respectively while Porter C. John(1974)(12) ,Corles Clark Edward(1976)(13) and Hurley W.L.(2004)(4)saw it at 8th week of gestation. Secondary bud formation was seen at 14th week of gestation. This was in accordance with Anderson R.R.(1974)(6)who saw them at 14wks. The transverse section of this stage showed branching of a rounded structure due to formation of deep clefts which were formed from infolding of basal layers. This was in accord to Karp G. et al (1981)(14).

Tertiary sprouts were seen at 18th week of gestation as observed by Myers J.A.(1917-b)(15) in female albino rats .In human beings they are called as branches of secondary sprouts.

Canalisation appeared at 20th week of gestation as seen by Revis Don R. Jr.(2003)(10)&Salazar H. et al (1971)(16). Williams P.L.(2000)(7)saw it at 22nd week of gestation. Canalisation appeared at the proximal or inner end as noticed by Hurley W.L.(2004)(4)This is not in agreement to Brouha L.(1905)(17) who noticed the appearance of lumen in the external portion of the ducts first.

The differentiation of the lining epithelium of the duct into two layers of cuboidal cells was seen at 5th month of gestation but the myoepithelial cells could be recognized in foetus of 210 mm C.R.L. as seen by Kass Rena and others.(2004)(18)

Embryonic type of fat was seen during all stages of development. There was regular and dense arrangement of connective tissue in the form of collagen fibers and fibroblasts around the developing anlage which is required for branching process to continue .A large number of blood vessels are present So interactions between epithelium and mesenchyme are required for organogenesis and cytogenesis to proceed as observed by Karp Gerald et.al (1981)(19). There is no sexual dimorphism as observed by Kellokumpu Lehtinen P.et.al (1986)(20). Variation in the size & shape of the anlage on the two sides of the same fetus was seen in anlage of 180 mm C.R.L. fetus. Moreover the anlage of 180mm C.R.L. fetus was more developed then 182mm C.R.L. fetus. Variation was also seen in the mode of canalisation. No anomaly of fetal breast development was detected in the present study. Also there is no difference in the prenatal development of Mammary gland in male and female.

SUMMARY: The development of fetal mammary gland entails a process of growth, differentiation, secretory activity and regression. This process of fetal mammary development involves a complex mechanism of cell interaction and hormonal balance. The present study reveals the changes in the epithelium in each stage from 33mm C.R.L.to 270mm C.R.L.. The anomalies reported in the development of breasts due to drifting of the cells medially and laterally from the mammary line like polymastia , polythelia, athelia , supernumerary nipples were not seen in the study undertaken. Therefore from the present study one can conclude that major part of development of fetal mammary gland occurs during second trimester of

ORIGINAL ARTICLE

pregnancy and continues until the last trimester of pregnancy. Also there is no difference in the prenatal development of male and female. Individual variation were seen in the development of mammary gland in accordance to Raubitschek (21) who wrote in the beginning of his work that probably no other organ is subject to such great fluctuation in the development, as the mammary gland.

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Table - 1

S. No.	C.R.L. in mm	Age in days	Male/Female	No.of cases
1	33	58	-	1
2	43	65	-	1
3	70	83	F	2
4	77	88	F	1
5	80	90	F	1
6	88	95	F	1
7	90	96	F	1
8	104	106	F	1
9	108	108	F	1
10	110	110	F	3
11	117	115	F	2
12	122	118	F	1
13	125	120	F	1
14	130	123	F	2
15	138	128	2-F, 1-M.	3
16	142	131	F	2
17	145	133	2-F, 1-M.	3
18	150	136	F	2
19	160	143	F	1
20	165	146	F	1
21	170	150	M	1
22	175	153	F	2
23	180	156	F	1
24	182	158	F	1
25	185	160	F	1
26	190	163	1-F, 1-M.	2
27	206	174	M	1
28	210	176	F	2
29	212	178	F	1
30	270	216	M	1

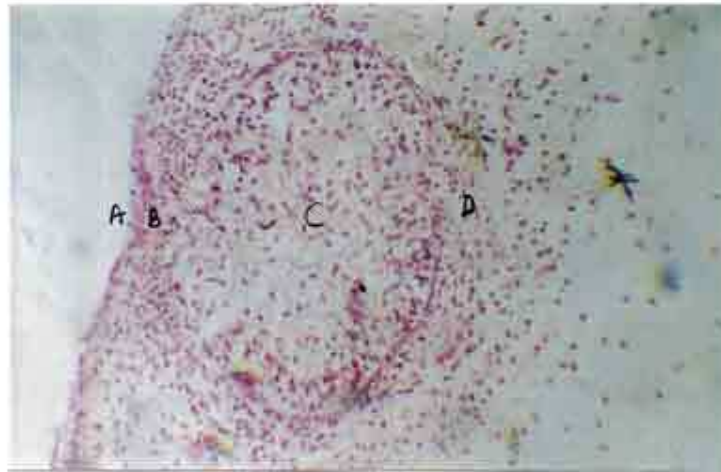


Fig. 1- Mammary Pit(A), Neck(B) of Primary bud(C) and condensed mesenchyme (D) in 80mm.C.R. length foetus

H&E * 100



Fig. 2-Epidermis(A), Secondary bud(B) and Mammary pit(C) in 110mm.C.R. length Foetus

Masson's Trichrome * 100



Fig. 3-Gap within the Anlage (A), Lumen within the tertiary buds (B)
In 180mm C.R. length fetus
H. & E. * 100

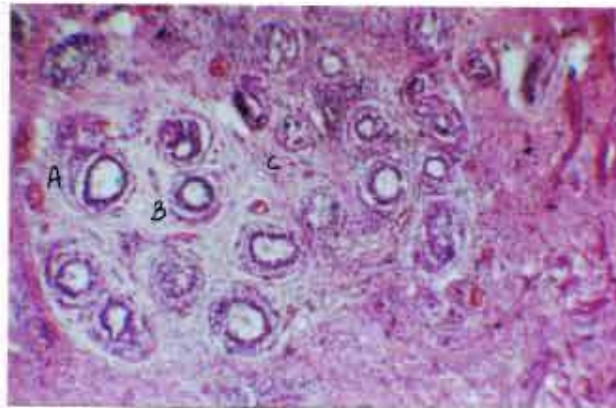


Fig. 4-Lobule formation by terminal ducts (A), Interlobular connective
tissue (B) and interlobular connective tissue(C) in
210mm C.R. length fetus
H. & E. *100

AGE COMPARATIVE STUDY ON SPINAL ANAESTHESIA AND AUDITORY FUNCTIONS

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ABSTRACT: BACKGROUND: Decreased hearing after various procedures involving opening of the dura mater resulting in leakage of cerebro spinal fluid (CSF) has been reported previously. We conducted this study as very few studies have explored the hypothesis that patient age may affect hearing loss after subarachnoid block. **OBJECTIVE:** To compare difference in hearing loss after spinal anaesthesia between young and elderly patients. **METHODS:** Prospective study conducted on 90 patients of either gender, ASA 1 or 2 scheduled for elective surgery under spinal anaesthesia. The group allocation was as follows: group Y: 30 patients aged ≤ 30 years; group M: 30 patients aged 31-60 years and group E: 30 patients ≥ 61 years. All subjects underwent clinical oto-laryngological examination and pure tone audiometry (PTA) in both ears under standardized conditions on the day prior to surgery (control value) and on the 2nd post spinal day. Significant hearing loss was defined as difference of > 15 dB between the pre operative and post spinal PTA values. Statistical analysis included the one way ANOVA, two way ANOVA and Chi-square tests. **RESULTS:** The overall incidence of significant hearing loss in the study was 7.7%. The percentage of patients developing significant hearing loss in groups Y, M & E were 6.6%, 13.3% and 3.3% respectively. Only one patient in group M (3.3%) complained of mild post dural puncture headache (PDPH). The incidence of significant hearing loss in patients below 60 years was more compared with patients >60 years. **CONCLUSION:** Minor change in hearing threshold may occur after spinal anaesthesia and younger patients are more prone to it. **KEY WORDS:** Spinal Anaesthesia, Auditory functions, Pure-tone audiometry

INTRODUCTION: Spinal anaesthesia has few clear advantages over general anaesthesia as it is less costly, confers patient satisfaction and is more useful in patients with difficult airway and respiratory diseases, favorable for diabetic patients on account of little risk of unrecognized hypoglycemia and for faster return of gut functions postoperatively. Spinal anaesthesia produce complications such as pain on injection, backache, urinary retention to serious problems like hypotension, post dural headache (PDPH), neurological complications cranial nerve palsies and even cardiac arrest¹.

Research in the last decade has added another one to the list of complications i.e impaired auditory function after spinal anaesthesia. Several studies have reported hearing loss after spinal anaesthesia suggesting that minor hearing defects frequently occur²⁻³. Hearing loss has also been reported in other clinical situations, involving opening of the duramater resulting

in leakage of CSF like lumbar puncture⁴, myelography, vp shunts⁵, acoustic neuroma surgeries and neurosurgeries⁵.

On the basis of the hypothesis that patient age may affect hearing, we conducted an age comparative study to find out whether hearing loss differs between patients of different age groups receiving spinal anaesthesia.

MATERIAL AND METHODS: This prospective study was conducted on 90 patients of either gender with ASA I and II scheduled for elective surgery under spinal anaesthesia. Patients were divided into three groups on the basis of age. Group Y included 30 patients aged 30 years and below, group M included 30 patients aged 31 to 60 years and group E included 30 patients aged 61 years and above. A clinical oto-laryngological examination was done and pure tone audiometry in both ears was conducted under standardized conduction in a sound proof room by an experienced audiologists on the day prior to surgery (control value) and on the 2nd postspinal postoperative day. A regularly calibrated audiometer (MA52 diagnostic Audiometer: MAICO) was used to test low frequencies, which was defined as 125Hz, 250 and 500Hz; speech frequencies defined as 500,1000, 2000Hz and high frequencies defined as 2000, 4000, 6000 8000 Hz. Hearing loss was considered significant if the difference between pre-operative and post spinal PTA values was >15dB statistical tests. Patients with conduction defects in external or middle ear, hearing impairment, acute otitis media, upper respiratory tract infection within one week of the surgery, Meniers disease, unwilling or uncooperative patients, patients on ototoxic medication (eg. aminoglycosides, salicylates, loop diuretics) were excluded from the study.

All patients were given Diazepam .2 mg/kg body weight per oral on the day prior to surgery and Tab Diazepam 0.1 mg.kg orally in the morning on the day of surgery. Preloading was done with 10 ml/kg of ringer's lactate solution and intravenous fluid (crystalloid/colloid) was continued at 4-6 ml/kg/hour during entire surgical procedure and for the first 24 hours postoperatively to maintain SBP > 100 mmHg. If systolic blood pressure did not respond to fluid therapy, ephedrine was given as 6 mg intravenously in incremental doses to bring the SBP to optimum level. Spinal anaesthesia was given in the lateral position using 2.8 ml of 0.5% hyperbaric bupivacaine at the L2-3/L3-4 intervertebral space using 25 gauge Quincke needle. Intraoperative monitoring included heart rate, ECG and arterial saturation (SPO₂) continuously during the surgery and for one hour postoperatively. Non invasive blood pressure was checked every five minutes for the first half an hour after spinal and every 15 minutes, there after till the end of surgery. Postoperatively NIBP was recorded hourly for the first four hours and thereafter 4 hourly for the first 24 hours.

Patients were visited twice daily upto 72 hours post operatively and were specifically questioned about any subjective symptoms regarding hearing loss, fullness in ears, tinnitus and nausea. Patients were also asked about post dural puncture headache and its severity was noted as: mild (slight restriction of patients physical activity), moderate (patients have to stay on bed part of the day) and severe (patients are bed ridden the entire day and make no attempts to raise their head or stand)⁷. Patients were also clinically examined for any dysfunction of the 3rd, 4th, 6th, 7th & 8th cranial nerves.

Statistical analysis of demographic data was made using one way ANOVA test. Comparison of variations in hearing thresholds was done by two way ANOVA test, while comparison of cases found to have hearing loss >15dB by chi-square test. A p value of <0.05 was considered as statistically significant.

RESULTS: The mean age of patients in group Y was 25.8 ± 3.64 years, while in group M it was 45.37 ± 7.1 year and in group E the mean age was 67.43 ± 5.9 years. The gender distribution in all three groups was statistically comparable ($P=0.180$). All patients in group E belonged to ASA class II while in group Y and M only 10% and 23.3% of the patients belong to ASA class II. Most of the patients in study achieved a highest sensory block level of T10 and the difference in the highest level of sensory block achieved was statistically comparable among the three groups ($P=0.731$). (Table 1)

All patients in the study remained stable haemodynamically. The lowest mean SBP values were statistically comparable among the study groups ($p= 0.13$). The number of patients requiring vasopressor to maintain SBP >100 mm Hg was 11, 11 & 7 in groups Y, M & E respectively and this was statistically not different for the three study groups ($P= 0.443$).

The overall incidence of significant hearing loss after spinal anaesthesia in the study was 7.7%. In group Y 2 patients (6.6%) developed significant hearing loss at 1000Hz. In groups M 4 patients (13.3%) had significant hearing loss (Table 2). One developed hearing loss at 125Hz while the other 3 patients had hearing loss at 6000Hz and 8000Hz. In group E only one patient (3.3%) developed significant hearing loss at 250 Hz.

In the higher frequencies tested by PTA there was no change between the preoperative and post operative values. In the left ear there was no significant change in PTA values at any of the low or high frequencies. In group E there was minor increase in the mean hearing threshold in the low and speech frequencies. While there was change in the high frequencies in the right ear, slight increase in mean hearing threshold was seen at all frequencies in the left ear.

On intergroup comparison of group Y and M, the mean difference in hearing threshold was significant at 125Hz ($p=0.002$) and 250 Hz ($p=0.002$) in the right ear. In the left ear mean difference in hearing threshold was significant at 1000Hz ($p=0.001$) and 2000Hz ($p=0.002$). In the right ear more hearing loss was seen in group Y at 125 & 250 Hz, while in the left ear it was more at 1000 and 2000Hz. On comparing group Y & E no significant difference between the mean hearing threshold was seen at any of the frequencies. On comparing the mean hearing threshold in group M and E, we found statistically significant increase in mean hearing threshold at 250 Hz ($p=0.016$) in the right ear and at 500 Hz ($p= 0.043$), 1000Hz ($p= 0.043$), and 4000Hz ($p= 0.025$) in the left ear.

Only one patient (3.35%) in group M developed mild PDPH as compared to none of the patients in groups Y and E. None of the patients in any groups had post spinal complications like subjective hearing loss, fullness in ears, tinnitus, dizziness, nausea or cranial nerve deficit in the post operative period. (Table 3).

DISCUSSION: Spinal anaesthesia is one of the most widely used techniques of regional anaesthesia¹. The group allocation was according to age of the patients. Male and female distribution was statistically comparable in all the three groups. Group Y and group M had more patients belonging to ASAI while for group E all the patients (100%) belonged to ASAI and this was probably on account of the age factor and comorbidities related to it.

The mean difference in the level of spinal block was not statistically significant between the three groups (Table 3). Intraoperatively as well as post operatively the mean systolic and diastolic blood pressure was lower in group Y compared with group M and group E since elderly patients tend to have higher blood pressure values. Lowest recorded blood pressures were comparable among the three groups (Table 5 & 6).

PURE-TONE AUDIOMETRY: In our study, pure tone audiometry was done on two occasions, one preoperatively which was considered as base line value, and then on 2nd post spinal day. PTA was conducted at low frequencies (125, 250, 500Hz), speech frequencies (500,1000 and 2000Hz) and high frequencies (2000, 4000, 6000 and 8000 Hz). In the present study we considered significant hearing loss as difference of > 15dB at any frequency between pre-operative and postoperative PTA values. On comparing the number of patients who had an increase in hearing threshold of >15dB between pre-operative and post-operative values, we found that there were 2 patients (6.6%) in group Y, 4 patients (13.3%) in group M while only 1 patient (3.3%) in group E had significant hearing loss.

On intergroup comparison group Y and group M were compared with each other, it was seen that the mean increase in hearing threshold at 125Hz (p=0.002) and 250Hz (p=0.002) was significantly more in the right ear while in the left ear the difference in hearing threshold was significantly more at 1000Hz (p=0.001) and 2000Hz (p=0.02) in group Y. When the difference in mean hearing threshold in group M was compared with group E, we found statistically significant increase in mean hearing threshold at 250 Hz (P=0.016) in the right ear and 500, 1000 and 4000 Hz (P= 0.043, 0.043 and 0.025) respectively for the left ear (Table 5).

Gultekins and Ozcan 2002⁶ compared the incidence of hearing loss after spinal anaesthesia in young and elderly using PTA. They observed that there was significant hearing loss among the younger age group patients as compared to elderly in the low frequency range (52% vs 16%) (P=0.014).

In our study when we looked at the incidence of significant hearing loss in patients below 60 years of age, we found 6 out of 60 patients below 60 years (2 patients in group Y and 4 patients in group M) had significant hearing loss i.e there was 10% incidence of hearing loss in patients below 60 years as compared with 3.3% in group E (age >60 years). We found that the overall incidence of hearing loss in patients below 60 years was lesser in our study (10%) compared with the study by Gultiken et al (16% in younger group). It could possibly be because of the fact that we defined significant hearing loss as difference between preoperative and post spinal PTA values was ≥ 15 dB whereas they had considered difference of >10dB as significant hearing loss. It has been explained that the direct connection between CSF and the perilymph via the cochlear aqueduct is the causative factor in hearing loss caused by spinal anaesthesia.

Gulay et al (2004) conducted⁷ study to assess hearing loss in young adult patients aged 20-40 years after spinal anaesthesia and found no significant hearing loss in any of his patients. He commented that CSF leakage via the dural puncture hole may not be the only factor involved in hearing loss and changes in plasma osmolarity may influence hearing levels by causing changes in motility of the sensory cells (hair cell) of the organ of corti. When we considered all the 90 patients in our study who developed hearing loss following spinal anaesthesia irrespective of age, total 7 patients out of 90 (7.7%) patients had hearing loss in the low frequency following spinal anaesthesia.

Fog et al⁸ observed a decrease in hearing level >10dB at low frequency in 4 out of 14 patients (29%) with the use of 26 gauge spinal needle. Again their incidence is much higher than the overall incidence in our study (7.7%). The possible explanation for lesser incidence of hearing loss in our study could be that we defined significant hearing loss as difference of 15dB or more between preoperative and postoperative PTA values.

Wang³ demonstrated 42% hearing loss following spinal anaesthesia in patients undergoing TURP⁹. Sundberg et al observed very high incidence of low frequency hearing loss in patients undergoing TURP under spinal anaesthesia.

It is well known that TURP itself produces profound alteration in fluid and electrolyte balance. The solution passes into the blood stream and causes changes in the osmolarity between blood and CSF. However in our study patients undergoing surgery were well distributed for various surgical procedures ie orthopaedics, obstetrics and gynaecology, general surgery and urology. This could be one of the factors for lesser incidence of hearing loss in our study (7.7%) compared with Sundberg⁹.

Patients were evaluated for any post spinal complications for a period of 72 hours postoperatively. None of the patients complained of subjective hearing loss, fullness in ear, tinnitus nausea or dizziness post operatively. There was no dysfunction of 3rd, 4th, 6th, 8th cranial nerve observed post operatively in any patient.

Occurrence of hearing disorders after spinal anaesthesia has frequently been reported to be associated with post-spinal headache syndrome¹⁰. Several authors have suggested an association between post dural puncture headache and hearing loss³. PDPH is generally attributed to decrease intracranial pressure caused by CSF leak through the dural puncture a phenomenon similar to that attributed for hearing loss following spinal anaesthesia².

In our study we found PDPH incidence was low (3.3%) and there were no patients in group Y and group E who suffered from PDPH. In the middle age group one patient experienced mild PDPH which required only slight restriction of physical activity and this particular patient did not have hearing loss at any frequency hence we did not find any correlation between PDPH and hearing loss.

Sundberg (1992)⁹ also did not find any correlation between hearing loss and post spinal headache using either 22 gauge ((Quinqueor 22 gauge (whitcare).

Unexpected complication during postoperative period is puzzling experience for the anesthetist. Hearing loss is not an uncommon complication following spinal anaesthesia and patient's age may be an etiological factor. However it is usually transient and subtle but awareness regarding this is important in anaesthesia practice for medico legal implications and in specific set of patients such as pilots. Better understanding of the mysterious condition is crucial to improve safety profile.

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Table 1 Distribution of patient's characteristic among various study groups.

		Groups		
		Y	M	E
Age (in years) Mean ± SD		25.80±3.64	45.37 ±7.11	67.43 ±5.96
Gender	(M:F)	18:12	23: 7	24:6
ASA status (1:2)		27:3	23:7	0:30
Highest level of sensory block (T10:T 9: T8)		26:4:0	25:4:1	26:4:0
Requirement of vasopressure (Yes: No)		11:19	11:19	9:23

Table 2 Distribution according to patients with significant hearing loss in each group

Frequency HZ	Group Y (n%)	Group M (n%)	Group E (n%)
125	0 (0)	1.(3.3%)	1 (3.3%)
250	0 (0)	0(0)	0(0)
500	0(0)	0(0)	0(0)
1000	2(6.65)	0(0)	0(0)
2000	0(0)	0(0)	0(0)
4000	0(0)	0(0)	0(0)
6000	0(0)	2(6.65)	0(0)
8000	0(0)	1(3.3%)	0(0)
Total n%	2 (6.6%)	4 (13.3)	1 (3.3)

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Table 3 Distribution according to severity to post dural puncture headache (PDPH)

	Group			
	Y n (%)	M (n%)	E (n%)	P-value
Mild	0 (0)	1 (3.3)	0 (0)	.403
Moderate	0 (0)	0 (0)	0 (0)	
Severe	0 (0)	0 (0)	0 (0)	

P value : 0.40

Table 4 Intra Group Comparison of Group Y and M

	Group Y		Group M		P value Right ear	P value Left ear
	Right ear	Left ear	Right ear	Left ear		
Frequency (Hz)	Difference Mean ± SD	Difference Mean ± SD	Difference Mean ± SD	Difference Mean± D		
125	-3.16 ±4.44	-1±7.70	-0.16±2.45	0 ±6.29	.002	.584
250	-3.5± 3.74	-2.5±10.31	0.16±4.82	0.66±7.03	.002	.170
500	-3.33 ± 5.14	-1 ± 11.09	-1±5.78	1.83±9.32	.104	.289
1000	-3.66±6.93	-5.33±6.68	-2.83±4.29	0.33±5.71	.578	.001
2000	-0.83 ±7.20	-4.83±5.64	-1±5.78	-0.16±5.64	.922	.002
4000	-2.66±7.39	-2 ±5.81	-1.66±5.14	1.33±7.97	.546	.070
6000	-1.33 ±6.14	-4.5±7.46	-1.83 ±5.79	-3.66±10.66	.747	.727
8000	-0.33± 4.472	-1.33 ±8.19	-1.5 ±7.78	-2.16±8.47	.486	.700

Intra Group Comparison of Group Y and E

	Group Y		Group E		P value Right ear	P value Left ear
	Right ear	Left ear	Right ear	Left ear		
Frequency (Hz)	Difference Mean ± SD	Difference Mean ± SD	Difference Mean ± SD	Difference Mean± D		
125	-3.16 ±4.44	-1±7.70	-1.16±3.86	-1.16 ±9.06	.068	.939
250	-3.5± 3.74	-2.5±10.31	-3± 5.017	-1.16±2.84	.664	.498
500	-3.33 ± 5.14	-1 ± 11.09	-2.66±5.37	-2.16±5.03	.625	.602
1000	-3.66±6.93	-5.33±6.68	-2.16±4.67	-2.5±4.86	.330	.066
2000	-0.83 ±7.20	-4.83±5.64	-0.66±2.53	-4.33±11.19	.905	.828
4000	-2.66±7.39	-2 ±5.81	-0.16±5.94	-2.66±5.20	.154	.642
6000	-1.33 ±6.14	-4.5±7.46	-2.33 ±5.20	-1.83±6.22	.499	.138
8000	-0.33± 4.472	-1.33 ±8.19	-0.33 ±4.34	-1.83±5.94	.571	.788

ORIGINAL ARTICLE

Intra Group Comparison of Group M and E

	Group M		Group E			
	Right ear	Left ear	Right ear	Left ear		
Frequency (Hz)	Difference Mean \pm SD	Difference Mean \pm SD	Difference Mean \pm SD	Difference Mean \pm D	P value Right ear	P value Left ear
125	-0.16 \pm 2.45	0 \pm 6.29	-1.16 \pm 3.86	-1.16 \pm 9.06	.237	.565
250	0.16 \pm 4.82	0.66 \pm 7.03	-3 \pm 5.017	-1.16 \pm 2.84	.016	.191
500	-1 \pm 5.78	1.83 \pm 9.32	-2.66 \pm 5.37	-2.16 \pm 5.03	.252	.043
1000	-2.83 \pm 4.29	0.33 \pm 5.71	-2.16 \pm 4.67	-2.5 \pm 4.86	.567	.043
2000	-1 \pm 5.78	-0.16 \pm 5.64	-0.66 \pm 2.53	-4.33 \pm 11.19	.774	.074
4000	-1.66 \pm 5.14	1.33 \pm 7.97	-0.16 \pm 5.94	-2.66 \pm 5.20	.300	.025
6000	-1.83 \pm 5.79	-3.66 \pm 10.66	-2.33 \pm 5.20	-1.83 \pm 6.22	.727	.419
8000	-1.5 \pm 7.78	-2.16 \pm 8.47	-0.33 \pm 4.34	-1.83 \pm 5.94	.265	.861

A CROSS SECTIONAL STUDY OF AETIOLOGY OF ANAEMIA IN ADOLESCENT GIRLS PRESENTING TO A TERTIARY CARE HOSPITAL

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ABSTRACT: Anaemia is a very common problem in our country and iron deficiency is the most common cause especially in the adolescent age group of girls. Auto-immune haemolytic anaemia (AIHA) is an acquired type of haemolytic anaemia, caused by autoantibodies directed against the red cells. We hereby report a cross sectional study of chronic severe anaemia, which presented to our hospital for evaluation. 5 patients of the 36 patients evaluated over a period of 3 months were found to have a haemolytic anaemia. 2 patients had beta thalassemia minor and 3 patients had autoimmune haemolytic anaemia with warm antibodies. Treatment with prednisolone resulted in significant improvement of the haematological parameters in these 3 patients along with blood transfusion. Alternative aetiological causes of anaemia should be considered in patients with microcytic hypochromic anaemia for proper management of patients.

KEYWORDS: Adolescent Girls, iron deficiency, haemolysis, blood transfusion, corticosteroids.

INTRODUCTION: The problem of anaemia in adolescence girls is 56% as per the UNICEF report in 2010. UNICEF has instituted an Adolescent girls anaemia programme in view of the gravity of the problem¹. Iron deficiency is the most common cause of anaemia in women especially in the age group of 20 to 45 years. This is due to menstrual blood loss, low bioavailability diet, poverty and ignorance of proper diet. Poor nutrition is a significant factor for the development of anaemia due to iron deficiency². However all cases of microcytic hypochromic anaemia tend to be labelled as nutritional especially in the setting of a government hospital which renders to predominantly low socioeconomic strata and are managed with iron supplements. We made an attempt to find alternate causes of anaemia in this age group of women. EMPLOYEES STATE INSURANCE medical college is a referral hospital and most of the referrals are for blood transfusions with severe anaemia and a provisional diagnosis of iron deficiency anaemia. We felt a need to study the aetiological factors of anaemia other than iron deficiency for better management strategies

Auto Immune Haemolytic anaemia (AIHA) is the clinical condition caused by autoantibodies, which bind to the red cell surface resulting in extravascular haemolysis. AIHA are classified into warm AIHA, cold AIHA, mixed type and drug induced type. Warm antibody type accounts for 70% of all AIHA. It is of Ig G type and usually does not fix the complement. AIHA can be a primary disorder (50%) or secondary to lymphoproliferative diseases, other systemic autoimmune diseases, viral infections, immune deficiency states, etc. Direct Coomb's test which detects Ig and/or Complement bound to the surface of the red cell is the diagnostic test for AIHA³. Beta thalassemia is a hereditary haemolytic anaemia Detection usually involves lower than normal MCV value (<80 fL). Plus an increase in fraction of Haemoglobin A2 (>3.5%) and a decrease in fraction of Haemoglobin A(<97.5%).

MATERIAL AND METHODS: All women in the age group of 15 to 25 years with a haemoglobin of less than 6 gms per deciliter and admitted in the female medical ward of ESI MEDICAL COLLEGE hospital over a period of 3 months were included in the study. We included patients who were referred for blood transfusion and had microcytic hypochromic anaemia. We excluded pregnant women and those with past pregnancy and child birth. We also excluded women with comorbid medical illness such as tuberculosis, connective tissue disorders and malignancies. We also excluded patients with obvious blood loss.

The patients were asked a detailed history with special reference to blood loss, drug intake, connective tissue disorders and malignancies. They underwent a detailed medical examination with special emphasis on detecting the previously mentioned diseases.

The complete haemogram of all the patients was analysed. The subgroup of 5 patients with increased reticulocyte count, increased indirect bilirubin and increased reticulocyte index(>3) were subjected to tests of haemolysis such as Coombs test, lactate dehydrogenase and serum haptoglobin. They were also subjected to viral serological tests such as HBsAg, HIV, Epstein Barr Virus Capsid antigen and TORCH panel (Toxoplasma, Rubella, Cytomegalovirus and Simplex). They were also screened for antinuclear antibodies.

RESULTS: 32 Patients who satisfied the inclusion criteria were enrolled in the study. 27 patients with microcytic hypochromic anaemia had all the criteria for iron deficiency. The patients with iron deficiency had low serum ferritin and increase total iron binding capacity. 5 out of the 32 patients had markers of haemolysis such as increased reticulocyte count, increased reticulocyte index, increased indirect bilirubin and reduced haptoglobin (<6). The peripheral smear of these 5 patients revealed numerous spherocytes, polychromasia and nucleated red blood cells.

Two of the 5 patients had beta thalassemia minor on haemoglobin electrophoresis with a haemoglobin A2 level of more than 3%. In the remaining three patients direct Coombs test was positive at room temperature and 37 degree and indirect Coombs test was negative. A diagnosis of warm antibody immune haemolytic anaemia was made based on these findings in these 3 patients.

The patients with iron deficiency anaemia and beta thalassemia were treated with blood transfusions and iron supplements in appropriate cases. Deworming with albendazole in standard doses was done. The three patients with a diagnosis of warm antibody haemolytic anaemia were put on prednisolone at the dose of 1 mg per kg body weight and showed a dramatic improvement in their haemoglobin levels. There was a reduction in the haemolytic parameters such as lactic dehydrogenase and reticulocyte index.

ORIGINAL ARTICLE

DISCUSSION: The incidence of iron deficiency in adolescent girls in our study is very high with over 80% patients in this category. In a nationwide survey reported by Ramesh Chellan and Lopamudra Paul nearly 90% had iron deficiency anaemia in the adolescent age group⁴.

The frequency of beta thalassemia was 6% in our population. The frequency of beta thalassemia was 3-5% in a study done by SS Ambekar et al in Maharashtra with beta minor accounting for 21% of cases in adults⁵. In a study done by P LAHARI et al the incidence of beta thalassemia was found to be very high in the Indian population⁶. 6% of our patients had AIHA with severe anaemia and markers of haemolysis. Vanamala et al in their study found that AIHA a predilection to female and was prone for severe anaemia necessitating blood transfusion⁷. Choudary et al in their study demonstrated a good response to corticosteroids in patients with AIHA⁸. Ganty et al in their study found 51% of their patients to have a primary AIHA after screening for malignancies and connective tissue disorders⁹.

CONCLUSION: All cases of microcytic hypochromic anaemia need to be evaluated in detail so as to detect autoimmune haemolytic anaemia. Special attention need to be paid to patients presenting with severe anaemia, recurrent anaemia and with no obvious blood loss history. The lab parameters of haemolysis such as lactic dehydrogenase, reticulocyte index and serum haptoglobin along with the Coombs test are especially useful in the diagnosis of warm antibody autoimmune haemolytic anaemia. The diagnosis of AIHA will alter the management of anaemia in the sense that they are responsive to corticosteroids and with blood transfusion will result in rapid improvement of anaemia.

ACKNOWLEDGMENTS: We acknowledge Dr Manjula. M for her necessary support. We also thank Dr Vedha. P, Department of pathology for her necessary help.

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ORIGINAL ARTICLE

AETIOLOGY OF ANAEMIA IN OUR STUDY-TOTAL 32 PATIENTS

Serial number	Disease	number	Percentage
1	BETA THALASSEMIA MINOR	2	6%
2	AIHA	3	9%
3	IRON DEFICIENCY	27	85%

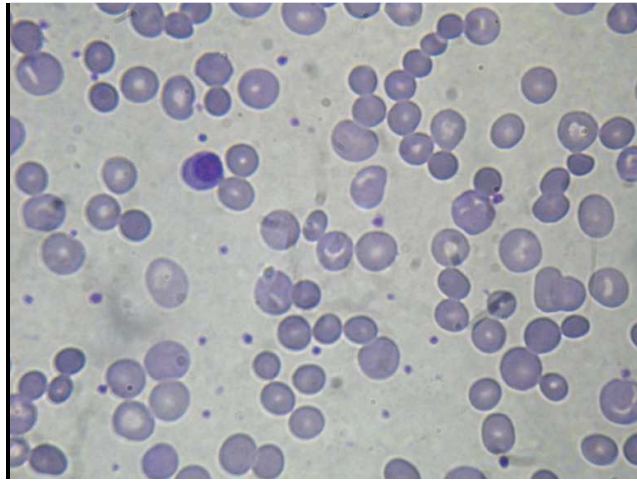


Figure 1 .peripheral smear showing spherocytes ,one Normoblast and Polychromasia

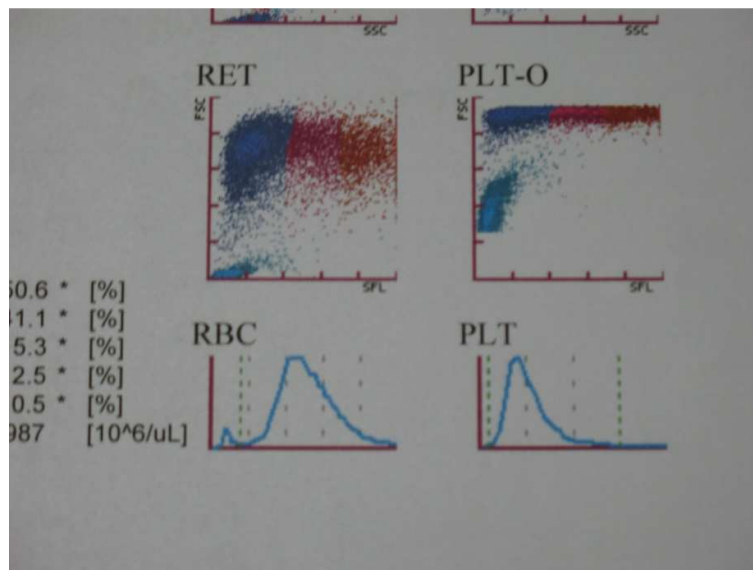


Figure 1 Hemogram showing marked reticulocytosis



Figure 2. Positive Direct Coombs test

CASE REPORT

UNUSUAL PRESENTATION OF ACUTE PULMONARY EDEMA IN SEVERE PREECLAMPTIC PATIENT DURING CESAREAN SECTION: A CASE REPORT.

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ABSTRACT: Acute pulmonary edema during pregnancy is very rare and occurs in 0.08% pregnancies. About 3% of severe preeclamptic patients develop acute pulmonary edema. Among them 30% develop it in the antenatal period with 90% having pre existing chronic hypertension and 70% develop it in the postnatal period. Several risk factors have been identified: preeclampsia or eclampsia, use of tocolytic therapy, severe infection, cardiac disease, iatrogenic fluid overload, and multiple gestations. No matter what the underlying pathology, resuscitation is the foremost priority. Only after the patient has been stabilized, attention can be turned to the formulation of a differential diagnosis to address the underlying condition and initiate specific treatment. This case examines one such presentation and reviews some of the diagnostic possibilities.

KEY WORDS: Pregnancy, severe preeclampsia, pregnancy and obesity, acute pulmonary edema, acute pulmonary edema in preeclampsia, emergency cesarean section, complications in pregnancy

INTRODUCTION: Acute pulmonary edema during pregnancy, though an uncommon event in pregnancy (0.08%).^[1] is associated with an increased risk of maternal and fetal morbidity and mortality. Pulmonary edema is infrequently encountered in patients with severe pre-eclampsia without associated medical, surgical or obstetric complications. In an analytical study of 37 consecutive cases by Sibai et al.^[2] pulmonary edema was diagnosed in 2.9% of cases complicated by severe pre-eclampsia and eclampsia. One such case is reported which is presented unusually during the time of cesarean section.

CASE REPORT: A 27 year old, booked primigravida with single live intrauterine fetus with gestational age of 39 weeks presented to labor room with complaints of sudden onset blurring of vision, headache, and nausea since morning. Patient had history of mild degree high blood pressure (140/90- 150/90 mmHg) for last 1 month but was not on any medication. On the day she presented to our hospital with headache and BP of 190/120mmHg with urine showed albumin (++) and pedal edema. Inj. Labetalol 20 mg iv and inj. MgSO₄ 10 gm IM loading dose was given. Cardiocotogram showed reactive pattern with baseline HR between 150-155 beats per minutes. Patient's condition was deteriorating clinically and blood pressure was not

CASE REPORT

responding to even after three repeated doses of injection Labetalol 10 mg each at an interval of 5 to 10 minutes. Emergency LSCS was planned and patient shifted to operating room. Patient was conscious alert and oriented, afebrile, morbidly obese (BMI 41.15kg/m²) with weight of 108 kg and her estimated ideal body weight was 54.7 Kg. Patient gave no history of smoking, tobacco or any drug abuse. No other co morbid conditions were found.

She took her last meal 2 hrs ago. General physical examination revealed BP 186/126 mmHg and heart rate 124 /minute, regular, respiratory rate 24/ minute and bilateral pitting pedal edema. Bilaterally chest was clear, with normal vesicular breath sound with no adventitious sounds. Both the heart sounds heard, were normal and no added sounds. No neurological deficit was found. Fetal heart rate was 148/min.

Airway examination revealed adequate mouth opening with inter incisor distance of more than 3 finger width; she had no dentures, artificial or loose teeth. Flexion and extension of neck was normal. Neck was thick and short with thyromental distance 6 cm and sternomental distance 10 cm approximately and Mallampati class –II.

Patient was kept on left lateral position in pre-op area with Oxygen supplementation by face mask. Through an 18 gauge IV line in left forearm, colloid (Hydroxy ethyl starch 130/0.4) was started. Patient was premedicated with Inj. Metoclopramide 10mg and inj. Ranitidine 50mg (non particulate antacid not available) and shifted to operating room with prepared difficult intubation cart.

Patient positioned with wedge under right buttock, oxygen supplementation continued and monitoring connected. General anesthesia planned on view of unknown coagulation profile. Procedure explained including cricoid pressure to the patient. Injection Labetalol 20 mg IV bolus was given. Preoxygenation was done for 5 minutes. After dressing and draping rapid sequence induction started along with cricoid pressure with Inj Thiopentone 500mg and Inj Succinylcholine 100mg. Ventilation was done with appropriate size guedel's airway but patient desaturated to 85% within 15-20 seconds of Succinylcholine injection. An intubation trial was done and was successful in first attempt with 7mm ID size endotracheal tube under direct vision, position confirmed with capnography, tube cuff inflated and cricoid pressure released.

Patient was ventilated in volume control mode with 100% oxygen and PEEP 5 cm H₂O but the saturation did not improve. When the PEEP was increased to 10 cm of H₂O, the saturation improved to 95% and remained there till delivery, after which it improved to 100%.

After 10 min of intubation- white frothy secretion was noted in ET tube, but there was no particulate material or blood. Saturation came down to 88%. Intermittent suctioning of tube was performed to maintain saturation above 95% with 100% oxygen. Inj. Frusemide 20 mg IV was given suspecting pulmonary oedema.

General anesthesia maintained with Isoflurane (MAC 0.65 to 0.70) and after delivery Inj. Fentanyl 60 mcg, Inj. Midazolam 2 mg and inj. Ketorolac 30 mg used. Inj. Oxytocin 10 units were added in drip after delivery and uterine contraction was found to be adequate. Baby was shifted to NICU, after resuscitation and evaluation by attending pediatrician.

Intraoperative systolic BP had varied between 140-150 mmHg and diastolic BP between 90-100 mmHg) and heart rate remained close to baseline. IV Fluid 500 ml of colloid and 700 ml Ringer Lactate over 1 hour was given intraoperatively.

Postoperatively patient was unable to maintain saturation on manual bag ventilation and blood pressure reached 180/120 mmHg, so anesthesia deepened and patient shifted to ICU with Bain's circuit with application of PEEP without extubation. Shifting was uneventful. In the ICU the patient was put on SIMV mode with PEEP 10 H₂O. Blood pressure was controlled with

CASE REPORT

NTG infusion @ 0.5 mcg/kg/minute. Inj. Frusemide infusion started @ 20 mg/hour. MgSO₄ was not given intraop and immediate post operative period because patient was under GA and facility for estimation of serum Mg level was not available. Patient was recovering well and blood pressure under control. She was weaned from ventilator same night and kept on T-piece and extubated in the morning next day. NTG infusion tapered off same night and patient did not need any further antihypertensive.

Patient needed oxygen supplementation for 24 hour postoperatively. She was shifted to ward with advice to perform deep breathing exercise and incentive spirometry.

DISCUSSION: Acute pulmonary edema is a relatively rare complication during pregnancy. A review of 62,917 consecutive pregnancies by Sciscione et al.^[2] has shown that the incidence acute pulmonary edema during pregnancy or in the postpartum period is 0.08%.

Pulmonary edema is defined as the accumulation of fluid in the pulmonary interstitial spaces and alveoli, which prevents the adequate diffusion of both oxygen and carbon dioxide. The pathogenesis of pulmonary edema complicating pre-eclampsia-eclampsia is a subject of extensive investigation. The low colloid oncotic pressure, coupled with increased vascular permeability and the loss of intravascular fluid and protein into interstitial tissues, increases the risk of pulmonary edema.^[3] Preeclampsia is a multisystem disorder that primarily affects the maternal cardiovascular, central nervous, and genitourinary systems. However, all systems become involved to some degree. Acute pulmonary edema is a severe, sometimes frightening complication of severe preeclampsia and eclampsia. A report by Donnelly and Lock^[4] on 533 patients who died of toxemia showed that pulmonary edema was a cause of death in 25% cases. Pregnancy decreases oxygen reserves secondary to decrease in the functional residual capacity. Obesity leads to fat accumulation on the thorax and abdomen which decreases chest wall and lung compliance. Decreased pulmonary compliance leads to decreased functional residual capacity (FRC), vital capacity, and total lung capacity. Reduced FRC can result in lung volumes below closing capacity in the course of normal tidal ventilation, leading to small airway closure, ventilation-perfusion mismatch, right-to-left shunting, and arterial hypoxemia. Anesthesia worsens this situation so much so that up to a 50% reduction in FRC occurs in the obese anesthetized patient. In this patient the reduced FRC further aggravates the hypoxia in the background of pulmonary edema. Hypoxemia and fall in oxygen saturation are not uncommon during general anaesthesia and any fall in saturation should be taken seriously. After ruling out disturbances of inspired oxygen concentration and ventilation, pulmonary edema should be suspected and other causes such as anemia, capillary leak syndrome and reactions to colloids should also be considered.

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CASE REPORT

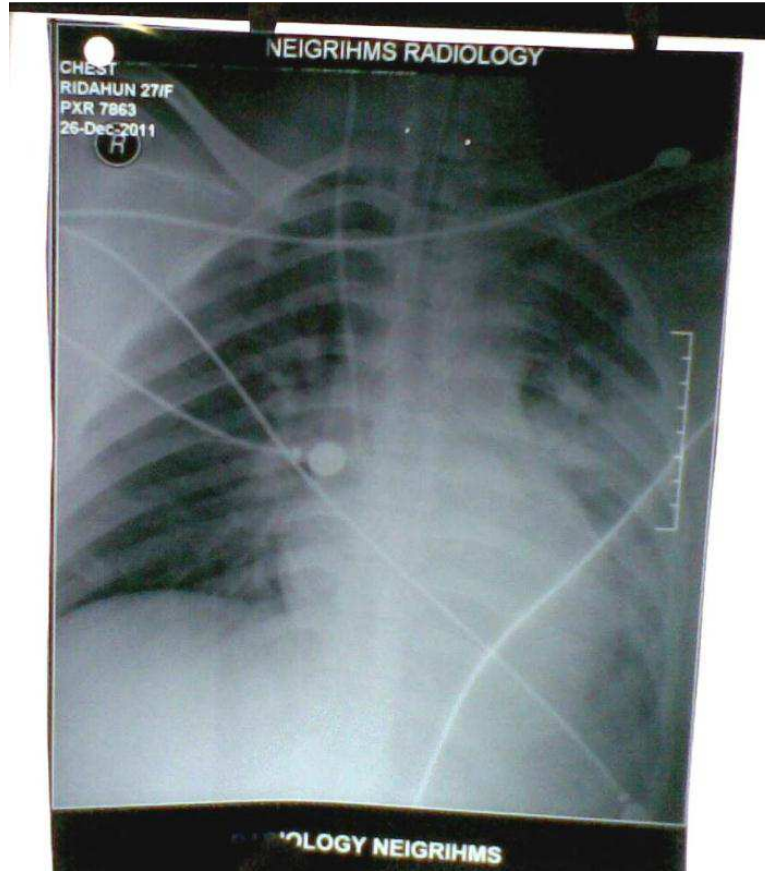


Fig: picture showing pulmonary edema feature in immediate postoperative period.

SEGMENTAL THORACIC SPINAL ANAESTHESIA FOR CHOLECYSTECTOMY – A CLINICAL TRIAL

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ABSTRACT: AIM OF STUDY: Cholecystectomy is generally performed under general anaesthesia but regional anaesthesia has been found beneficial, especially in patients with major medical problems. The objective of this study was to evaluate the effectiveness of segmental spinal anaesthesia in cholecystectomy so that it can be later used in patients when general anaesthesia is not feasible. **MATERIALS AND METHODS:** Twenty patients of ASA I and II of either sex undergoing elective cholecystectomy received a segmental spinal anaesthesia at 10th thoracic interspace (T₁₀- T₁₁) using 1.0 ml bupivacaine heavy (5 mgml⁻¹) mixed with 0.5 ml fentanyl (25 µg). An epidural catheter was placed in the same space. Intraoperative haemodynamic parameters were monitored. Systemic drugs were administered if patients complained of pain, anxiety, hypotension, nausea or pruritus during or after surgery. **RESULTS:** The block was effective for surgery in all patients except two who required epidural top up. Four patients required midazolam for anxiety and five required mephenteramine for hypotension at two minutes after spinal injection, otherwise haemodynamics and respiratory parameters were within physiological limits. Twelve patients complained of mild pruritus around face and neck which did not require any treatment. Fifteen patients were able to ambulate after surgery. There was good surgeon and patients' satisfaction. **CONCLUSION:** Segmental Spinal Anaesthesia with bupivacaine and fentanyl could be a safe and effective alternative anaesthetic regime for cholecystectomy. However this technique requires great caution as the needle is inserted above the level of termination of the spinal cord and more studies with more number of cases are required before advocating this technique.

KEY WORDS: Segmental thoracic spinal anaesthesia, cholecystectomy, bupivacaine, fentanyl.

INTRODUCTION: Gall stone disease is one of the most common aliment requiring surgical intervention. Cholecystectomy is usually performed under general anaesthesia, but, occasionally patients with major medical problems present significant challenges to the anaesthetist. General anaesthesia with opioids and neuromuscular blockers, as well as mechanical ventilation interferes with the respiratory system. The incidence of bronchial hyperactivity is increased in

patients with asthma or COPD and regional anaesthesia has been found beneficial in managing such patients. Adopting appropriate anaesthetic techniques can tremendously influence the preoperative stress and produce a positive impact on the overall surgical outcome. This study has been conducted to evaluate the effectiveness and feasibility of segmental thoracic spinal anaesthesia in elective cholecystectomy.

MATERIALS AND METHODS: After obtaining approval of Institute Ethics Committee 20 patients aged between 18 and 75 years of either sex with ASA physical status I and II undergoing elective cholecystectomy were enrolled for the study. Informed written consents were taken from all the patients. Patients with active cholecystitis and any condition contraindicating elective surgery or spinal anaesthesia were excluded from the study. Patients were explained about the procedure and were assured that any pain, anxiety or discomfort during surgery would be treated effectively with intravenous medication, or if they preferred, conversion to general anaesthesia.

All the patients received oral alprazolam 0.5 mg and ranitidine 150 mg on the night prior to surgery. In the preoperative room patients were preloaded with Ringer lactate and premedicated with inj ondansetron 4 mg intravenously. Monitoring includes NIBP, Pulse rate, peripheral oxygen saturation (SpO₂) and ECG.

The patients were placed in sitting position and under strict aseptic condition the T₁₀-T₁₁ epidural space was accessed using an 18 G Tuohy needle and 'loss-of-resistance' to air method. An epidural catheter was threaded in the space and taped in place leaving 3 cm in epidural space. A test dose of 2 ml lignocaine (2%) with adrenaline (1:200,000) was injected through the epidural catheter. There was no sign of any sensory or motor block or significant vital sign change within 5 minutes after the test dose. Spinal anaesthesia was then performed with 25 G Quincke's needle in the same space (T₁₀-T₁₁). When correct placement was confirmed by the flow of clear CSF, 1ml bupivacaine heavy (5mgml⁻¹) mixed with 0.5 ml (25 µg) fentanyl was injected. The patients were then placed in the supine position and oxygen was given by face mask at the rate of 2 litres min⁻¹.

Heart rate, blood pressure, and SpO₂ were recorded every minute for the first 15 min and then every 5 minutes thereafter. Sensory block (upper and lower) was assessed by pin prick and recorded every 5 mins until the start of surgery and every 15 mins thereafter. Motor block was assessed using modified Bromage scale (0-able to lift extended legs; 1- just able to flex knees, full ankle movement; 2-no knee movement, some ankle movement; 3- complete paralysis). Surgery was started after, the block reached T₄ as assessed by pin prick.

During the procedure, patients were encouraged to report any discomfort, pain, nausea or pruritus and assured that general anaesthesia will be given if they wished. Pain was treated with inj. fentanyl 50 µg, anxiety with midazolam 2 mg and hypotension with inj mephenteramine 3 mg, administered as iv boluses as when the systolic pressure drops more than 20% of the baseline during intra operative period. The epidural injections were to be administered in aliquots of 5 ml isobaric bupivacaine 0.5%, only if sensory block recedes below T₆ dermatome and systemic drugs were ineffective in controlling pain. General anaesthesia were to be given if above measures fail to relived pain or if the surgeons faced technical difficulty for the surgery.

Operative times as well as intra operative events were recorded. Patients were monitored for one hour in the post operative ward and transferred to their respective ward

after removal of epidural catheter. Before transferring, all the patients were asked about their satisfaction of the procedure and asked to grade as excellent, good or poor.

OBSERVATIONS AND RESULTS: The study included 20 patients, 4 males and 16 females with mean age of 41.7 ± 15.97 (SD) ; range (19-70) years, and mean weight of 53.35 ± 9.22 (SD); range (41-75) kgs. There were 15 ASA grade I and 5 ASA grade II patients. The duration of surgery was 60 ± 14.14 (SD) minutes; range (45-90) minutes (Table I). None of the patient required conversion to general anaesthesia.

An effective sensory block, median level: upper T₄ (range T₃-T₅); lower L₃ (L₁-L₅) developed within 15 minutes in every patient. Transient hypotension were recorded in 5 patients who were treated effectively with one dose of 3mg iv mephenteramine, otherwise haemodynamic parameters were minimally affected (Fig I – drawn with MS Excel).

The oxygen saturation was more than 95% (range 96-98%) throughout the intraoperative period in all the patients. Four patients received midazolam for anxiety and 12 complained of mild itching around face, neck and upper trunk, not requiring treatment. Two patients developed pain from surgical site before the completion of surgery so they were given 5 ml of plain bupivacaine (0.5%) through the epidural catheter (TableII).

The first indication of block regression was observed at 60 minute after intrathecal injection with median level decreasing by two segments at 90 minutes. Post operatively, 75% (15/20) of the patients could ambulate, but there was some minor degree of abdominal discomfort. Pruritus continued in the post operative period which was tolerable but no nausea or vomiting was observed. There were no hypotensive episodes in the post operative period (Table III-A & III-B). Eight patients (40%) graded the procedure as excellent while twelve (60%) patients rated as good, none of the patients were unsatisfied with the technique.

DISCUSSION: General anaesthesia is regarded as the safest anaesthetic technique for upper gastrointestinal surgeries. But patients with major medical problems especially respiratory disease ^{1,2} have high risk of intra as well as post-operative complications when undergoing general anaesthesia. Regional technique ^{2,3} have been found beneficial in situations where general anaesthesia either poses a great risk to the patient or is not feasible. A.A.J. Van Zundert et al. reported that segmental spinal anaesthesia can be used safely in patients with severe lung disease. This study shows that spinal anaesthesia ⁴ in the lower thoracic region (T₁₀-T₁₁) can be used to provide a segmental sub arachnoid block sufficient enough to perform cholecystectomy.

The 10th thoracic space was chosen as it was at the center of the surgical field. The use of low dose bupivacaine and thoracic puncture allows the segmentation of the spinal block, and also minimizes the degree of thoracic motor block. The minor and transient degree of lower limb motor block may be due to minimal physical spread of local anaesthetic to the lumbosacral nerve roots. The injected opioid and local anaesthetic produced its highest concentration in the surgically relevant segmental levels.

Cardiovascular changes were minimal even though local anaesthetic spread to affect most of the spinal cord segments responsible for sympathetic out flow. It may be due to the fact that all the patients in the study group belong to ASA grade I and II, who were adequately preloaded and remained conscious throughout the procedure, thus avoiding significant central depression of circulation. The next consideration is its effect on ventilatory mechanism resulting from extensive thoracic nerve block. The ventilatory parameters⁵ are well preserved under this technique. It is because diaphragm which is the main inspiratory muscle is unaffected as it is innervated from the cervical level and expiration is normally a passive phenomenon at rest.

However forceful expiration and coughing will be affected because they are generated primarily by the muscles of the anterior abdominal wall which are innervated by the thoracic nerves. In our study peripheral oxygen saturation (SpO₂) was maintained around 96-98%.

The most dreaded complication of this technique is injury to the spinal cord since the needle is inserted above the level of termination of the spinal cord. Recent studies regarding the anatomy of thoracic spinal canal⁶ with MRI revealed that there is substantially more space in the posterior subarachnoid space at mid thoracic level than at lumbar and upper thoracic levels. Magnetic resonance imaging confirms that the cord and the cauda equina touch the dura mater posteriorly in the lumbar and anteriorly in the thoracic region. MRI evaluation of posterior subarachnoid space in thoracic region demonstrated mean values of 5.8 mm at T₅, 3.9mm at T₂ and 4.1mm at T₁₀ thoracic levels⁷. Thus cautious use of intrathecal injection in the thoracic segment can be another anaesthetic option without much fear of traumatizing the spinal cord. Luiz Eduardo Imbelloni et al reported segmental subarachnoid block in high risk patients undergoing colon surgery.

In our study pruritus⁸, cause by intrathecal fentanyl was the most common side effect seen in 60% (12/20) of the patients. Other side effects were both infrequent and easily managed. Patient's anxiety was another factor which interfered with our technique since they remain conscious throughout the procedure. Patients' satisfaction score was high with our technique as 75% (15/20) of the patients were able to ambulate pain free at the end of surgery.

Cholecystectomy under segmental thoracic epidural block in a patient with twin gestation was reported by R. Barani Selvan⁹ et al. Segmental subarachnoid block as an effective technique for laparoscopic cholecystectomy was reported by A.A.J. Van Zundert et al. Manoranjan Kar¹⁰ et al also reported a prospective study of 300 cases of laparoscopic cholecystectomy under spinal anaesthesia. Combined spinal epidural anaesthesia¹¹ for laparoscopic appendectomy has been reported by Rajesh S. Mane without any complications.

CONCLUSION: In conclusion, this study shows that cholecystectomy could be successfully done under segmental thoracic spinal anaesthesia without any significant complications and may be used as an alternative technique where general anaesthesia is not feasible. The technique could be an option to expand the boundaries of regional anaesthesia in a new way. However more studies with more number of cases are required before recommending this technique for cholecystectomy.

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Table I : Patient demographics and surgical outcome

Sex ratio (M:F)	4:16
Age (in years)	41.7(μ);15.97(SD); 19-70(r)
Weight (in Kg)	53.35(μ); 9.22(SD); 41-75 (r)
ASA grade I: II	15:5
Duration of Surgery (in minutes)	60 (μ); 14.14(SD); 45-90 (r)
Epidural Top up required	2
Conversion to GA	0
Patients satisfaction score(E:G:P)	8:12:0
	μ =mean, r=range, SD= $\sqrt{\{\Sigma(x_i-\mu)^2/\Sigma_i\}}$ where x_i = observable variable,

Table II: Intraoperative events and medication

Parameters	No. of patients	Intraoperative Medication provided
Pain	2	Fentanyl(50 μ g)
Hypotension	5	Mephenteramine(3 mg)
Bradycardia	0	
Anxiety	4	Midazolam(2 mg)
Pruritus	12	
Nausea/ vomiting	0	
Inadequate anaesthesia	2	Epidural bupivacaine (0.5 %)

ORIGINAL ARTICLE

Table III A: Anaesthetic Outcome (Sensory Block)

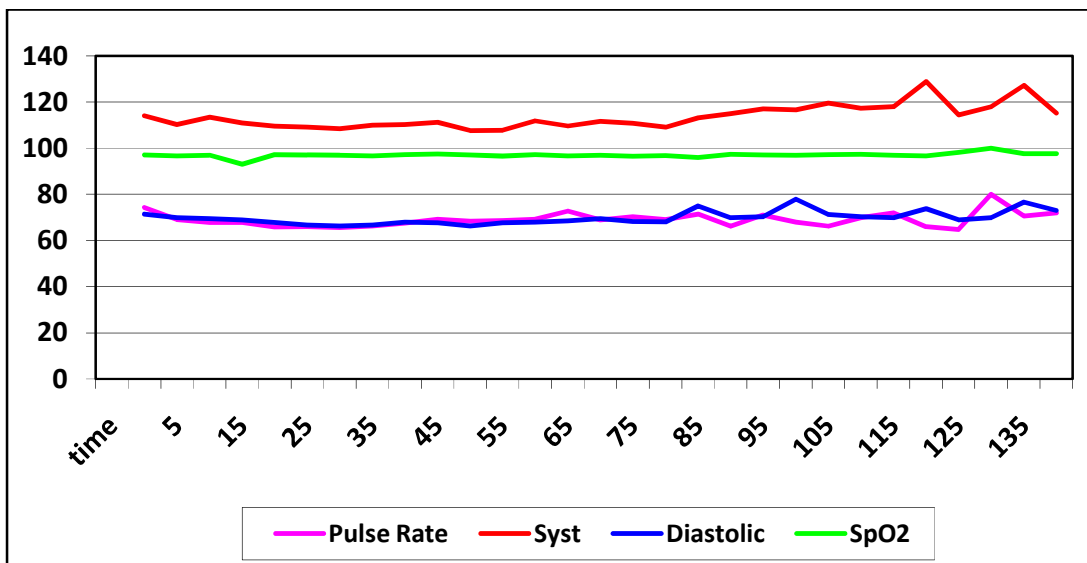
Time (in minutes)	Upper level (Dermatome)		Lower level (Dermatome)	
	Distribution(no of pt)	Median(range)	Distribution(no of pt)	Median(range)
15	5:12:3 (T3:T4:T5)	T ₄ (T ₃ — T ₅)	2:2:12:2:2	L ₃ (L ₁ — L ₅)
30	5:12:3 (T3:T4:T5)	T ₄ (T ₃ — T ₅)	2:2:12:2:2	L ₃ (L ₁ — L ₅)
45	3:10:7 (T3:T4:T5)	T ₄ (T ₃ — T ₅)	2:2:12:2:2	L ₃ (L ₁ — L ₅)
60	7:10:3 (T4:T5:T6)	T ₅ (T ₄ — T ₆)	2:10:4:2:2	L ₂ (L ₁ — L ₅)
75	4:8:8 (T4:T5:T6)	T ₅ (T ₄ — T ₆)	2:10:4:2:2	L ₂ (L ₁ — L ₅)
90	4:10:6 (T5:T6:T7)	T ₆ (T ₅ — T ₇)	12:15:2:2:1	L ₁ (T ₁₂ -L4)

Table III B: Anaesthetic Outcome (Motor Block)

Bromage Grade	No. of patients with Bromage Grade			
	0	1	2	3
Before Surgery	14	3	3	0
After Surgery	15	3	2	0

No. of patients able to ambulate at the end of surgery = 15/20

Figure I: Haemodynamics



MORBIDITY DUE TO ARI IN PRESCHOOL CHILDREN IN RELATION TO COOKING FUEL, OCCUPATION AND FAMILY SIZE.

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ABSTRACT: INTRODUCTION: Indoor air pollution & occupation family size, have been known to play an important role in prevalence of ARI especially in developing countries like India. These factors alone contribute to 20-30% incidence of pneumonia in developing countries as opposed to 3-4% incidence in developed countries. **MATERIAL & METHODS:** A prospective one year longitudinal study was conducted among 3135 children of pre-school age group belonging to rural field practice area of 'Rama Medical College & research center'. They constituted 14.94% of the total population. **RESULTS & DISCUSSION:** All children under 5 years of ages were examined for sign and symptoms and severity of ARI and no of average episodes. For every 5 children studied, 4 suffered from ARI. Children from families where wood was used as cooking fuel suffered 3.33 average episodes in contrast to children from families where gas was used suffered 2.40 average episodes. Respiratory episodes were highest 4.19 average episode in families with maximum family members. Although bacteria and viruses are the immediate causes of most acute respiratory infections, malnutrition, air pollution, smoking, and overcrowding are the underlying drivers of vulnerability. **CONCLUSION:** It was therefore concluded that type of fuel & occupation and family size played a key role in determining severity of ARI. A reduction in these risk factors can strategically lower the prevalence of ARI among rural community.

KEYWORDS: Acute respiratory tract infection, preschool children, morbidity.

INTRODUCTION: Acute respiratory infections (ARI) are also important causes of morbidity and mortality in children worldwide. An estimated 4.3 million deaths every year are attributed to ARI. About 33% of these deaths occur in the under five population. According to the world health organization (WHO) children below 5 years of age in the developing world suffer about 2-6 episodes of ARI annually. [1,9]

Despite their toll, acute respiratory infection has been called "the forgotten pandemic" because they have not attracted sufficient attention from governments, the global health community. [2]

Every year some 12 million children in developing countries die before they reach their fifth birthday, many during the first year of life. Seven in ten of these deaths are due to acute respiratory infections (mostly pneumonia), diarrhea, measles, malaria or malnutrition or a combination of these conditions. [3]

ARIs are the leading cause of illness and death in children worldwide according to the atlas malnutrition in utero, during infancy and in early childhood is a major culprit. The impaired development of a fully functioning immune system makes young children particularly susceptible to ARIs. [4]

ARI accounts for 20% of all deaths among children of the age group 0-14 years and highest mortality has been reported among infants where the death rate in some countries even exceeds 2000 per 1,00,000 live births. [5]

Acute respiratory infection (ARI) is an acute infection of any part of the respiratory tract and related structures including paranasal sinuses, middle ear and pleural cavity. [6]
The development and implementation of a control programme for ARI is an essential component of primary health care approach. [7]

MATERIAL & METHODS:

(1) Type of Study:

Descriptive, epidemiological community based study done by interview method of the mothers, of the children aged 0-5 years in the PHC, sub centre, remote villages of RHTC Shivrajpur.

(2) Study Area:

(a) 26 villages of Shivrajpur RHTC service area under Community Medicine Department of RMC, Kanpur. 26 villages were selected to give complete coverage of rural population. Villages were divided into strata-PHC village, sub-centre, village remote, and village. Villages & household from each stratum were selected by simple random technique & total 3135, under 5 population were registered for study.

(3) Methodology:

The longitudinal study was conducted in field practice areas of rural field training centre (RFTC), Shivrajpur managed by Community Medicine Department of Rama Medical College Hospital & Research Centre, Mandhana, Kanpur from Jan. 2009 to Dec. 2009. This RHTC provides health service to surrounding 62 villages. Out of these 26 villages were selected, to give complete coverage of rural population. The children were 3135 in number & constituted about 14.94% of total population. Workers were trained to diagnose & manage ARI on WHO guidelines.

House to house visit was conducted to collect necessary information. After explaining the aim of study an interview was conducted by questionnaire method. Information collected was entered in Performa & fortnightly follow ups were done. Reports were collected at monthly interval. 10% of the work was checked by direct observation. Reports collected at monthly interval were analyzed in Dept. of Community Medicine by direct observation.

Assessment of knowledge & skill of workers to recognize & manage ARI were done using WHO guidelines. Training package included.

- 1) Identification of ARI.
- 2) Management of ARI.
- 3) Referral.
- 4) Impart Health Education to mothers.

Health education was given to mothers in groups of 20-25 with help of flip charts, photographs, posters.

(4) Inclusion Criteria: Any child having one or more of following symptoms was identified as ARI case.

- Cough.
- Blocked/Running nose.
- Ear ache/ discharge.
- Sore throat.
- Difficulty in breathing/ nosily breathing.
- Fever present or absent.
-

New episode was considered as in which patient. Had been free of symptoms for last 48 hrs.

(5) Exclusion criteria:

1. Patients having history of cough greater than 7 days were excluded from the study.
2. Children whose families had not been residing in the community for the past 3 months.
- 3.

(6) Statistical analysis:

Data were pooled and evaluated.

Data analysis was done by-

1. Calculating the percentages.
2. Applying the Chi-square test.

RESULT & DISCUSSION: In the present study total 3135 under five study subjects were enrolled. Sex wise distribution of males was 54.67% and females were 45.33% respectively. Out of 3135 study subjects, age wise distribute was 24.30% in 0-1 years, 22.99% were 1-2 years age group, 19.20% were 2-3 years age group, 16.81% were in 3-4 years age group <5were 16.68%.

20.98% of population didn't suffer from any episodes of ARI, 79.02% of population suffered from one or more episodes of ARI (10122) table 1. This was Due to the fact that respiratory infections spread by the aerosol route and hence very difficult to prevent. Out of the total episodes (10122) maximum 87.69% (8873) episodes were mild, 9.18% (938) were moderate, and 3.13% (320) were of severe grade. Thus giving an average episode of 3.23%/child/year.

Children from family where, family members <4 suffered total minimum episodes (19.92%) total 2017 episode, and an average episode of 2.65. Children from family with family member 5-8, 9-12, +12 suffered from average episode of 3, 3.5, and 4.19 respectively. Highest average episode was in family with more than 12 members. (Table no. 2) Which may be due to the fact of relatively lowered attention paid by the mother with increased family size. The

lowest average episode was in 1-4 and this difference was found statistically highly significant $P < .001$.

Children from families where wood was mainly used as fuel suffered highest average episode 3.34 (table no. 3) this could be correlated with the fact that during wood burning polyaromatic hydrocarbons are released which act as strong irritant to the respiratory mucosa membrane. In our present study maximum children 2641 (84.24) were from families where wood was mainly used. This could be explained by the fact that wood is easily available in villages and food cooked in chullah is believed to be more palatable. The comparative less consumption of kerosene and gas was due to the fact of lack of easy availability of these items. In the present study of under five population maximum episodes 41.67% (4218), 38.54 (3902) episodes were suffered by the children of farmers and labourers respectively. This is attributed to the fact of their direct exposure to difference of temperature in the field. [8, 9]

CONCLUSION: Morbidity pattern of ARI is directly related to risk factors like family size, occupation, type of fuel. Thus the present study signifies of intensive health education campaigns to educate villagers on combating malnutrition, smokeless chullah and home remedies of ARI. Further the development and implementation of a control programme for ARI is strongly recommended in primary health care approach.

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ORIGINAL ARTICLE

Table No. 1 – ILLUSTRATES DISTRIBUTION OF ACUTE RESPIRACTORY INFECTION ACCORDING TO SEVERITY

SR. NO.	GRADES OF A.R. INFECTION	TOTAL
1.	Mild	8873 (87.69)
2.	Moderate	938 (9.18)
3.	Severe	320 (3.13)
	Total episode	10122

Above table depicts that maximum 87.69% episode were of mild grade, only 9.18% were of moderate grade and 3.13% were of severe grade.

Table No. 2 – CO-RELATION BETWEEN FAMILY SIZE, SEVERITY OF A.R.I. AND AVERAGE EPISODE

SR. NO.	TOTAL FAMILY MEMBERS	POPULATION	TOTAL	AVERAGE EPISODE
1.	1 – 4	762 (24.23)	2017 (19.92)	2.64
2.	5 – 8	1103 (35.03)	3320 (32.79)	3.00
3.	9 – 12	774 (24.80)	2706 (26.73)	3.50
4.	+12	496 (15.93)	2079 (20.53)	4.19
	Total	3135 (99.99)	10122 (100.0)	
X ² = 37.89 df = 6 p < .001 highly significant				

Average table depicts average respiratory episode was highest in family where member were more than 12 and lowest where family members were 1-4 and this different was found statistically significant.

ORIGINAL ARTICLE

Table No. 3 – DEPICTS CORRELATION BETWEEN TYPE OF FUEL USED AND SEVERITY OF ARI AND AVERAGE EPISODE

SR. NO.	FUEL USED	TOTAL POPULATION	TOTAL	AVERAGE EPISODE
1.	Wood	2641 (84.26)	8808 (87.06)	3.34
2.	Coal	408 (13.01)	1092 (10.76)	2.68
3.	Kerosene	81 (2.58)	210 (2.07)	2.59
4.	Gas	5 (0.15)	12 (0.11)	2.40
	Total	3135 (100)99.98	10122 (100.0)	

Children from families where wood was used suffered highest average 3.33, in contrast to children from families where gas was used suffered comparatively lesser episode of respiratory infection 2.40.




Table No. 4 – CORRELATION BETWEEN OCCUPATION AND SEVERITY OF ARI AND AVERAGE EPISODE

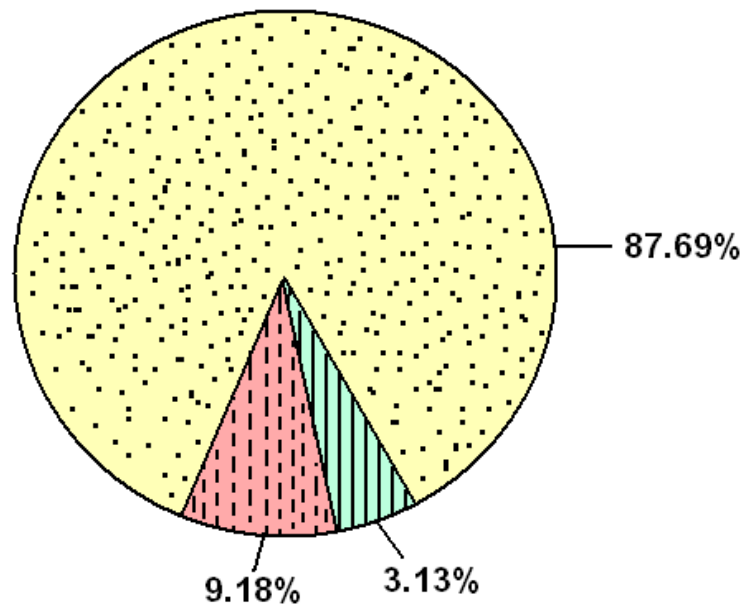
SR. NO.	OCCUPATION	POPULATION	TOTAL	AVERAGE EPISODE
1.	Farmer	1355 (43.24)	4218 (41.67)	3.11
2.	Labourer	1164 (37.13)	3902 (38.54)	3.35
3.	Businessman	184 (5.86)	610 (6.02)	3.32
4.	Teachers	86 (2.74)	288 (2.84)	3.35
5.	Govt. Servant	108 (3.44)	334 (3.29)	3.09
6.	Others	238 (7.59)	770 (7.60)	3.24
	Total	3135	10122	

Average respiratory episode suffered by labours were 3.35, businessman were 3.31, teachers were 3.34 Farmers suffered from 3.11 respiratory episode and Govt. servants suffered from 3.09 respiratory episode.

Figure - 1 (table - 1.) PIE DIAGRAM SHOWING DISTRIBUTION OF GRADE OF ARI ACCORDING TO SEVERITY.

ACUTE RESPIRATORY INFECTION GRADE.

-  MILD GRADE
-  MODERATE GRADE
-  SEVERE GRADE



AN EPIDEMIOLOGICAL STUDY OF TUBERCULOSIS IN FOOTHILLS OF UTTARAKHAND.

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ABSTRACT: INTRODUCTION: The international tuberculosis situation is complicated by the growing impression that tuberculosis is no longer a major public health problem'. Zaki MH in 1968 had short listed the following factors: chronicity, ability of bacilli to stay alive in body for years, increase in life expectancy, high level of endemicity in ethnic groups even in the midst of affluence in the western world, the frequent occurrences of isolated epidemics in certain parts of the world and the emergence of MDRTB. The 1990 World Health Organization (WHO) report on the Global Burden of Disease ranked TB as the seventh most morbidity-causing disease in the world and expected it to continue in the same position up to 2020 [2]. **MATERIAL & METHODS:** The present study was conducted among all the families registered with the Rural & Urban Health Training Centers (RHTC & UHTC) under the jurisdiction of Field practice areas of the Department of Community Medicine, Himalayan Institute of Medical Sciences, Dehradun, Uttarakhand. It was Community based survey, Cross-sectional (Observational) study. Entire study population (10 years & above) with 100% enumeration (census) of households. House to house survey was conducted on all the families registered with the Rural & Urban Health Training Centers (RHTC & UHTC) under the jurisdiction of Field practice areas of the Department of Community Medicine, Himalayan Institute of Medical Sciences, and socio-demographic profile of each house-hold was recorded. **RESULTS:** It can be observed from the table that a total of 399(1.68%) symptomatic were screened out of a total study population of 23,618 from 10 different peri-urban field practice locations; 73(0.30%) symptomatics turned out to be cases of Tuberculosis confirmed either as sputum positive cases by Microscopy or by other criteria. It is evident that overall (mean) prevalence of the disease was 3.09 per 1000 study population; notably, the prevalence was as high as 16.17/1000 population at Khatta & Dorbassi followed by 13.04/1000 population at Doiwala. Age-wise distribution of Pulmonary Tuberculosis and statistical association of its prevalence with age. It can be observed from the above table that prevalence of Pulmonary Tuberculosis was found to be directly proportional to client's advancing age. Highest prevalence i.e 14.79/ 1000 was in 70 years & above age group, followed by 9.52/1000 in the age group of 60-70 years, 5.92/1000 in the age group of 40-50 years and 5.82/1000 in the age group of 50-60 years; the least prevalence i.e 1.48 / 1000 was

ORIGINAL ARTICLE

found in the age group of 10- 20 years. This difference in prevalence of pulmonary tuberculosis in terms of age group was statistically significant. **CONCLUSION:** We conclude that present day epidemiology of tuberculosis in India have not yet been fully elucidated, a considerable amount of information, of varying degrees of reliability and accuracy, has accumulated during the course of the last 30 or 40 years enabling us to see at least the outlines of the problem and furnishing the basis for future action.

KEYWORDS: Pulmonary Tuberculosis, prevalence, Uttarakhand, sociodemography.

INTRODUCTION: The international tuberculosis situation is complicated by the growing impression that tuberculosis is no longer a major public health problem'. Zaki MH in 1968 had short listed the following factors: chronicity, ability of bacilli to stay alive in body for years, increase in life expectancy, high level of endemicity in ethnic groups even in the midst of affluence in the western world, the frequent occurrences of isolated epidemics in certain parts of the world and the emergence of MDRTB. The 1990 World Health Organization (WHO) report on the Global Burden of Disease ranked TB as the seventh most morbidity-causing disease in the world and expected it to continue in the same position up to 2020 [2]. That the Tuberculosis situation in an area, community or country is the product of the 'Disease Triangle' comprising bacillus, host and environment is universally accepted. It is equally well established that these factors vary considerably from one country to another and from area to area in a country [10]. Unlike western countries, where a more or less efficient notification system has existed for a long time, India has been lacking in even approximate data about the prevalence and incidence of tuberculosis infection and disease as well as mortality rates. Although the relevant facts regarding the present day epidemiology of tuberculosis in India have not yet been fully elucidated a considerable amount of information, of varying degrees of reliability and accuracy, has accumulated during the course of the last 30 or 40 years enabling us to see at least the outlines of the problem and furnishing the basis for future action [11]. India is classified along with the sub-Saharan African countries to be among those with a high burden and the least prospects of a favorable time trend of the disease. The average prevalence of all forms of tuberculosis in India is estimated to be 5.05 per thousand, prevalence of smear positive cases 2.27 per thousand and average annual incidence of smear positive cases at 84 per 100,000 annually [9]. The available circumstantial evidence in India points towards a long history of many tuberculosis epidemics; tuberculosis was, is and may remain a dilemma in the future [12]. The national ARTI was estimated at 1.5% i.e. 75 new smear positive pulmonary TB cases are expected per 100,000 population annually [13]. Significantly, with atypical parameters like geotopographical / disadvantaged population living in periurban habitat/slums having varying socio-epidemiological predictors, the study of epidemiology of pulmonary tuberculosis is most likely to provide new insight. In view of rapidly changing and evolving evidence base in terms of epidemiological parameters and determinants of Pulmonary Tuberculosis in various settings, the present study has been designed to elicit and validate presumed epidemiological correlates and variables affecting Pulmonary Tuberculosis among field practice areas population of HIMS.

AIMS AND OBJECTIVES: To find out the prevalence of pulmonary tuberculosis among population aged 10 years and above. To determine the various socio-epidemiological correlates of pulmonary tuberculosis.

ORIGINAL ARTICLE

MATERIAL & METHODS: Study Population: All persons 10 years of age & above (17,952) belonging to the families registered with the Rural & Urban Health Training Centres under the jurisdiction of Field Practice areas of the Department of Community Medicine, HIMS, Dehradun were included as study population.

TYPE OF STUDY: Community based survey, Cross -sectional (Observational) study.

STUDY AREA: Universe of the Study comprised all the families registered with the Rural & Urban Health Training Centers under the jurisdiction of Field practice areas of the Department of Community Medicine, Himalayan Institute of Medical Sciences, and HIHT. Out of a total population of 23,618, population from across the catchments of Rural Health Training Centre (RHTC) i.e Rajeev Nagar, Teliwala, Khatta & Dor Bassi, Dharmuchak, Kurkawala, Keshavpuri, Gesharpuri & Doiwala was 12,588. Rest of the universe of the study was made up by a population of 11,030 from the catchments of Urban Health Training Centre (UHTC) i.e Chandreshwar Nagar and Shisamjhari, Rishikesh

DURATION OF STUDY: The period of the study was one (01) Year beginning from 19.05.2008 to 20.05.2009

SAMPLE SIZE: Entire study population (10 years & above) with 100% enumeration (census) of households.

METHODOLOGY: House to house survey was conducted on all the families registered with the Rural & Urban Health Training Centers (RHTC & UHTC) under the jurisdiction of Field practice areas of the Department of Community Medicine, Himalayan Institute of Medical Sciences, HIHT and socio-demographic profile of each house-hold was recorded.

All members 10 years of age and above from the surveyed house-holds having either history and or presenting complaints of cough for three weeks or more in duration and those already diagnosed cases of Pulmonary Tuberculosis included either as 'defaults', 'relapsed' 'failure', 'not completed treatment' or 'chronic' cases and undergoing treatment either from any Category of DOTS or non-DOTS regimen , were interviewed by administering a pre-designed , pre-tested and structured instrument.

Clients having cough for duration of 3 weeks or more and or having associated symptoms suggestive of pulmonary Tuberculosis and also those already diagnosed as cases of Pulmonary Tuberculosis undergoing treatment were identified as study subjects.

All data related to socio-demography, key practices / behaviors, environment, disease / morbidity profile including family history of the disease under study and history of present / past treatment of the study subjects were elicited and recorded.

A detailed clinical assessment of the study subjects was then carried out including general and systemic examination with particular reference to Respiratory system.

All newly detected symptomatics were subjected to sputum microscopy as per standard RNTCP Protocol.

Sputum was collected at RHTC & UHTC and sputum specimen sent to Department of Microbiology, HIMS for Direct Microscopy for AFB.

INCLUSION CRITERIA: All persons from among those 10 years of age and above, belonging to the families registered with the Rural & Urban Health Training Centers, under the jurisdiction of Field Practice areas of the Department of Community Medicine, HIMS, Dehradun

ORIGINAL ARTICLE

Having history and or presenting complaints of cough for three weeks or more in duration and

Already diagnosed cases of Pulmonary Tuberculosis included either as 'defaults', 'relapsed' 'failure', 'not completed treatment' or 'chronic' cases and undergoing treatment either from any Category of DOTS or non-DOTS regimen, comprised the study subjects.

EXCLUSION CRITERIA: Those patients who were cured or had already completed their treatment regimen with negative smears at the end of the treatment by either DOTS or non-DOTS regimen were excluded from the study.

A CASE OF PULMONARY TUBERCULOSIS: For the study purpose a case of pulmonary tuberculosis was defined as one who had at least two initial sputum smear examinations (direct smear microscopy) positive for AFB or a person with one sputum smear examination positive for AFB and radiographic abnormalities consistent with active pulmonary T.B. as determined by treating Medical Officer(MO) or TB in a patients with one sputum smear specimen positive for AFB and culture positive for M. tuberculosis or TB in a patient with symptoms suggestive of TB with at least three sputum smear examinations negative for AFB and radiographic abnormalities consistent with active pulmonary TB as determined by the treating MO followed by a decision to treat the patient with a full course of anti-tuberculosis therapy or diagnosis based on positive culture but negative AFB sputum smear examination [13].

RESULTS AND DISCUSSION: Area wise population of the Universe of the Study which comprised the field practice areas of the department of community medicine, Himalayan Institute of Medical Sciences, HIHT.

Out of a total population of 23,618, population from across the catchments of Rural Health Training Centre (RHTC) i.e Rajeev Nagar, Teliwala, Khatta & Dor Bassi, Dharmuchak, Kurkawala, Keshavpuri, Gesharpuri & Doiwala was 12588 (53.30%).

Rest of the universe of the study was made up by a population of 11,030(46.70%) from the catchments of Urban Health Training Centre (UHTC) i.e Chandreshwar Nagar and Shisamjhari, Rishikesh

It can be observed from the table that highest proportion of study subjects i.e. 183(45.88%) belonged to families with family size 3-5 followed by 137(34.33%) from families with size 6-8. Table 1.3 shows distribution of study subjects according to type of family they belonged. The families of most of the subjects and as many as 270(67.7%) were of unitary type followed by 129 (32.3%) joint families. The above table (1.4) also shows distribution of study subjects' families according to socio economic status as per modified B.G. Prasad's classification; most of the families with as many as 155(38.8%) belonged either to lower middle class or 139(34.8%) to upper lower class.

Table 2.1 gives distribution of the study subjects according to the local environment they live in. It can be seen from the table that study subjects' immediate vicinity had undesirable environmental contaminant/pollutant elements with 184 (46.1%) and 144(36.1%) of them living in a local environment of dust and smoke respectively. Table 2.2 shows distribution of study subjects by presence or absence of air pollution. Though any source of air pollution was not observed/reported by the most i.e. as many as 280(70.2%) of the subjects, 119(29.8%) of them nevertheless had a source of air pollution in the immediate environment. As regards distribution of study subjects' families by intensity of vehicular traffic as an environmental

characteristic, most of the respondents i.e. 264 (62.2%) reported minimal vehicular traffic as against 133 (33.3%) reporting moderate vehicular traffic. Table 2.4 gives profile of study subject's handling type of dust. Most of the respondents i.e. 244 (61.2%) reported handling house dust with insignificant proportions giving history of handling other kinds of dust. Distribution of respondents in terms of type of housing is presented at table 2.5. It can be observed that significant proportion of study subjects i.e. 233 (57.6%) lived in pucca houses followed by 123 (30.8%) living in semi pucca houses; only 46 (11.5%) respondents lived in Kutcha houses. Table 2.6 & 2.7 relate study subjects with overcrowding and ventilation. As many as 261 (65.4%) and 290 (72.7%) respondent subjects lived in overcrowded and inadequately ventilated houses respectively.

Table 3.1 shows profile of study subjects in terms of choice of type of diet. Significant proportion i.e. 270 (67.7%) of respondents were non-vegetarian as against 129(32.3%) vegetarians. As regards respondents' status of nutrition, it can be seen from table 3.2 that highest proportion of them i.e. 280(70.2%) were well-nourished. Table 3.3 shows distribution of respondent study subjects by behavior towards addiction particularly smoking habit. Significant proportion of the respondents i.e. 258(64.7%) were non-smokers as against 141(35.3%) smokers. Distribution of study subjects according to history of risk behaviors/ risk situations (table 3.4) reveals that a very insignificant proportion of respondents i.e 15(3.8%) had such history.

Table 4 shows area wise distribution of symptomatics and confirmed cases of Tuberculosis and its period prevalence. It can be observed from the table that a total of 399(1.68%) symptomatic were screened out of a total study population of 23,618 from 10 different peri-urban field practice locations; 73(0.30%) symptomatics turned out to be cases of Tuberculosis confirmed either as sputum positive cases by Microscopy or by other criteria. It is evident that overall (mean) prevalence of the disease was 3.09 per 1000 study population; notably, the prevalence was as high as 16.17/1000 population at Khatta & Dorbassi followed by 13.04/1000 population at Doiwala.

Table 5 reveals the number of confirmed cases of pulmonary tuberculosis among the symptomatic according to findings by sputum microscopy. It can be seen from the table that 52 (71.24%) were sputum smear positive cases as against 21(28.76%) of the cases being sputum negative.

CONCLUSION: We conclude that present day epidemiology of tuberculosis in India have not yet been fully elucidated, a considerable amount of information, of varying degrees of reliability and accuracy, has accumulated during the course of the last 30 or 40 years enabling us to see at least the outlines of the problem and furnishing the basis for future action [11]. Significantly, with atypical parameters like geo-topographical /disadvantaged population living in rural or periurban habitat/slums having varying socio-epidemiological predictors, the study of epidemiology of pulmonary tuberculosis is most likely to provide new insight. In view of rapidly changing and evolving evidence base in terms of epidemiological parameters and determinants of Pulmonary Tuberculosis in various settings, the present study has been designed to elicit and validate presumed epidemiological correlates and variables affecting Pulmonary Tuberculosis among field practice areas of population of HIMs.

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ORIGINAL ARTICLE

Table 1. Distribution of Study Subjects by Religion, Family size, Type of Family and Socio Economic Status (n=399)

Family Characteristics	No. of Families	Percentage
1.1 Religion		
Hindu	270	67.7
Muslim	125	31.3
Christian	4	1
Sikh	0	0
1.2 Family size		
1-2	20	5.01
3-5	183	45.88
6-8	137	34.33
>8	59	14.78
1.3 Type of Family		
Unitary	270	67.7
Joint	129	32.3
1.4 Socio Economic Status		
Upper		
Upper Middle	5	1.3
Lower Middle	31	7.8
Upper Lower	155	38.8
Lower	139	34.8
	69	17.3

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Table 2 Distribution of Study Subject by Family characteristics i.e. Local Environment, Source of Air Pollution, Vehicular Traffic, Type of Dust, Type of Housing, Overcrowding, Ventilation,

Family Characteristics	No. of Families	Percentage
2.1 Local Environment		
Smoke		
Dust	144	36.1
Fumes	184	46.1
(Others)	17	4.3
	54	13.5
2.2 Source of Air Pollution		
Present		
Absent	119	29.8
	280	70.2
2.3 Vehicular Traffic		
Minimal	264	66.2
Moderate	133	33.3
Heavy	2	0.5
2.4 Type of Dust		
House Dust	244	61.1
Wheat Dust	44	11.0
Coal Dust	11	2.8
Cotton Dust	4	1.0
Dye / Chemical	21	5.3
Cattle	18	4.5
Others	57	14.3
2.5 Type of Housing		
Pucca	230	57.6
Kutchha	46	11.6
Semi Pucca	123	30.8
2.6 Overcrowding		
Present	261	65.4
Absent	138	34.6
2.7 Ventilation		
Adequate	109	27.3
Inadequate	290	72.7

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Table 3 Distribution of Study Subjects by Type of Diet, Status of Nutrition, Addiction (Smoking Habit), Risk Behaviors / Risk Situations

Respondent Characteristics	No. of Respondents	Percentage
3.1 Type of Diet		
Vegetarian	129	32.3
Non Vegetarian	270	67.7
3.2 Status of Nutrition		
Well Nourished	280	70.2
Under Nourished	109	27.3
Over Nourished	10	2.5
3.3 Addiction (Smoking Habit)		
Smokers	141	35.3
Non Smokers	258	64.7
3.4 Risk Behaviors / Risk Situations		
History Present	15	3.8
History Absent	384	96.2

Table 4 Area wise Distribution of Symptomatic & Confirmed cases of Pulmonary Tuberculosis diagnosed by either microscopy or criteria other than microscopy (n = 399)

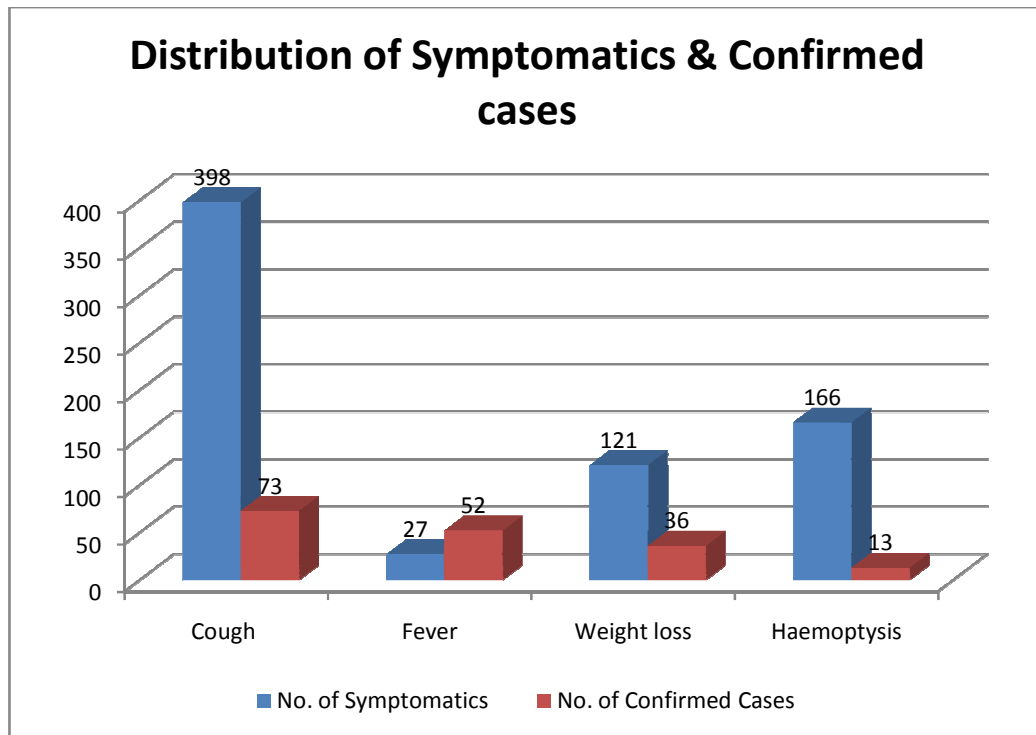
S.N	Area	Population Screened	No. of Symptomatic	Confirmed Cases [Old & New]	Prevalence [Per 1000]
1	Chandreshwar Nagar	7000	68 (0.97)	14 (0.20)	2.00
2	Shisamjhari	4030	113 (2.8)	23 (0.57)	5.70
3	RajeevNagar	639	8 (1.25)	1 (0.15)	1.56
4	Teliwala	3500	78 (2.22)	12 (0.34)	3.42
5	Khatta&Dorbassi	680	46 (6.76)	11 (1.61)	16.17
6	Dharmuchak	1378	14 (1.01)	0 (0)	0

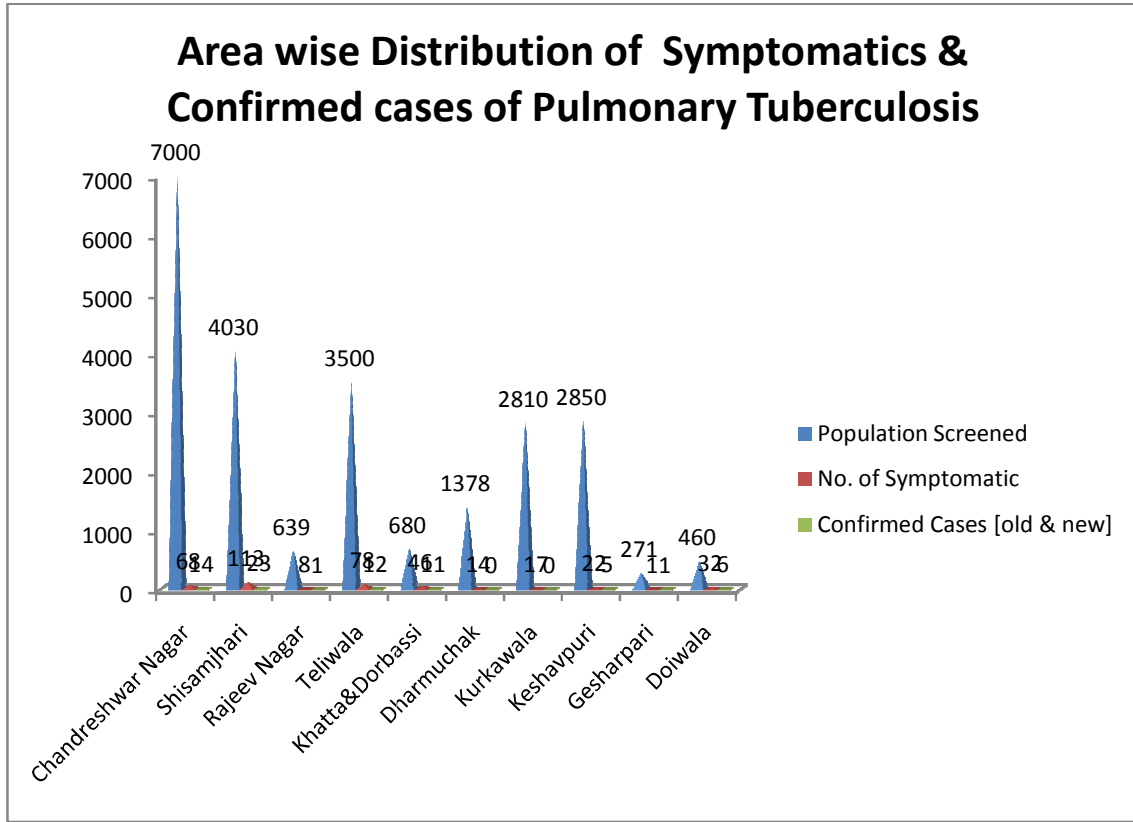
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7	Kurkawala	2810	17 (0.60)	0 (0)	0
8	Keshavpuri	2850	22 (0.77)	5 (0.17)	1.75
9	Gesharpari	271	1 (0.36)	1 (0.36)	3.69
10	Doiwala	460	32 (6.95)	6 (1.30)	13.04
	Total	23,618	399 (1.68)	73 (0.30)	3.09

Table 5 Distribution of confirmed cases of Pulmonary Tuberculosis by Microscopy for Sputum Positivity for Acid Fast Bacilli (n =73)

Diagnostic Status by Microscopy	Confirmed Cases	Percentage
Sputum smear positive Cases	52	71.24
Sputum Smear Negative Cases	21	28.76





CASE REPORT

GIANT PSEUDOCYST OF SPLEEN- A RARE CASE REPORT.

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ABSTRACT: False cysts of spleen or the pseudocysts accounts for about 75% of the non-parasitic splenic cysts and are usually traumatic in origin. These cysts are differentiated from the true cysts of the spleen by absence of an epithelial layer on histology. Primary cysts have a cellular lining that can be caused by congenital events or parasitic infection (Echinococcus). Secondary cysts have no cellular lining and may be of hemorrhagic, serous, inflammatory, or degenerative origin. Without a recent trauma history, there is no clinical or radiological feature which distinguishes them from epidermoid cyst. Distinction may be made at histology. Surgical management of these symptomatic pseudocysts promotes spleen parenchyma preservation. We present here a case of a giant splenic pseudocyst in a young male patient except history of trauma. As the patient was 16 years old spleen preserving surgery was done and postoperatively it was uneventful.

KEY WORDS: Splenic cyst, Giant, pseudocyst of spleen.

INTRODUCTION: Spleen undergoes cystic change less often than any other abdominal viscera¹. Splenic cysts are rare with around 800 cases reported in the world literature^{2,3,4}. Pseudocysts most often follow a blunt trauma, ^{1, 2, 3} incidence of pseudocyst is less than 1% of all splenectomies.

CLINICAL SUMMARY: A 16 years old male patient presented with a history of upper abdominal mass for the last 3 months. The mass was progressively increasing in size. There was no history of blunt injury to abdomen and patient was not a known alcoholic. Ultrasound report of the patient showed 20x17 cms large cystic lesion with innumerable low level echoes seen in the upper two third of spleen. CT scan was suggested which showed large cystic lesion of 16x19x16 cms seen in splenic parenchyma pushing left kidney inferiorly. Lesion was crossing midline beneath left lobe of liver. No calcification or internal cysts. Patient was posted for OT, left paramedian incision was made and abdomen opened, a huge cyst arising from the spleen noted, cyst was aspirated, partial excision of cyst and omentopexy was done, spleen was preserved. Post operative period was uneventful. Histopathological examination showed cyst wall composed of fibrocollagenous tissue, muscle infiltrated by lymphocytes, eosinophils & presence of numerous blood vessels. No epithelial lining seen.

CASE REPORT

DISCUSSION: Blunt abdominal trauma is the commonest cause of pseudocyst of spleen and occurs due to resorption of hematoma with subsequent serous fluid collection ^{2,6}. According to the classification of splenic cysts suggested by Martin et al, ^{1,2} splenic cysts can be primary (true) or secondary (pseudo/false). The secondary cysts do not have any definite lining whereas primary cysts have definite cellular lining and can be subdivided according to the etiology as parasitic and nonparasitic. Nonparasitic cysts can be either congenital or neoplastic. The formation of congenital splenic cysts results from the invagination of peritoneal mesothelial cells into the spleen during intrauterine development, followed by their proliferation and secretion of serous fluid ^{1,2}.

Most of the splenic pseudocysts (30 – 60%) are asymptomatic and cause problem only as they enlarge ^{2,4,7}. Common clinical presentation includes abdominal pain, nausea and vomiting due to compression of stomach by a large splenic cyst ^{2,4,7}. Complications of pseudocysts are rupture of spleen, intracapsular hemorrhage and infection ^{1,2,7}. The confirmation of diagnosis is possible only with histopathological examination.⁸ Commonly practiced treatment modality is splenectomy. Recently spleen preserving techniques including watch full waiting, percutaneous drainage, marsupialization, splenic decapsulization and complete cystectomy. In the past, splenectomy was the method of choice, considering treatment of various splenic lesions, including true (primary) cysts and pseudocysts ^{2,3,6}. The understanding of the function of the spleen in the immune system and increasing knowledge concerning early and distant splenectomy complications, especially septic, such as overwhelming post splenectomy infection (OPSI), which occurs in 0.2-0.5% of patients resulted in the withdrawal from splenectomy in favor of organ-sparing operations ^{2,6,8}. McColl et al., in order to prevent recurrence of primary and pseudocysts established a method consisting in the laparoscopic marsupialization of cysts, cavity lining with Surgicel and omentopexy ⁹.

CONCLUSION: Definitive diagnosis of a splenic pseudocyst is established only in some patients with a history of abdominal trauma and presence of cystic lesions in the spleen. Diagnosis of a splenic pseudocyst is based on the histopathological examinations, which show that the cyst is devoid of epithelial lining.

ACKNOWLEDGEMENT: We thank Dr Avadhani K Geeta, Professor of Surgery, Dean and Director, Mysore Medical College and Research Institute, Mysore for her kind support and co-operation.

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CASE REPORT

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FIG: 1 - Operative procedure showing pseudocyst, normal splenic parenchyma and omentopexy being done.

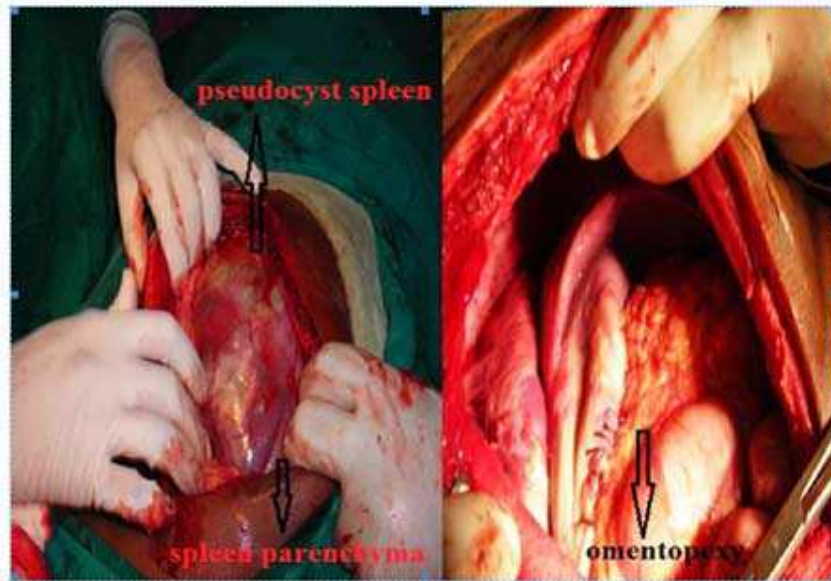


FIG: 2 - CT scan showing Giant Pseudocyst of spleen.



CASE REPORT

FIG: 3 - Microscopy showing pseudocyst admixed with normal splenic tissue. (Low power view)



COMPARISON OF DIAGNOSTIC EFFICACY OF NS1 ANTIGEN BASED IMMUNOCHROMATOGRAPHIC TEST WITH IMMUNO-SORBENT ASSAY AND ITS ROLE IN DETECTION OF EARLY DENGUE INFECTION

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ABSTRACT:INTRODUCTION: Dengue is an acute viral infection with potential fatal complications. Rapid and easy diagnosis of dengue can help in patient triage and care-management. The detection of dengue virus NS1 antigen by rapid lateral flow tests offers a faster method to a presumptive diagnosis in the peripheral centers of developing countries like India where the laboratory has no great technological backup. **MATERIALS AND METHODS:** A total of 351 sera from patients suspected of having dengue virus infection were tested for dengue NS1 antigen and dengue IgM and IgG antibodies by both ELISA and immunochromatographic test (ICT). **RESULTS:** From the 351 samples tested, 249 (70.94%) of the sera were found to be positive for DENV infection based on the IgM antibody or IgG antibody or NS1 antigen. Of the 249 samples 105 (42.16%) were positive for only IgM or only IgG or both antibodies by ELISA and 101 (40.56%) by ICT. Based on dengue NS1 antigen along with IgM and/or IgG tests, 144 (57.8%) were positive for dengue infections by ELISA and 139 (55.8%) by ICT. Among these 144 samples, only dengue NS1 antigen was detected in 67 (26.90%) by ELISA and 65 (26.10%) by ICT. **CONCLUSIONS:** Inclusion of NS1 in the diagnosis of dengue increases the detection rate significantly. The sensitivity of ICT for both antigen and antibody detection are almost equal to ELISA. Thus, the potential use of the NS1 antigen along with antibody tests in an ICT could increase the diagnostic efficiency for early diagnosis of dengue infection.

KEY WORDS: Dengue, NS1 antigen, ICT, Immunosorbent assay.

INTRODUCTION: Dengue is a mosquito borne arboviral disease caused by genus Flavivirus and transmitted to humans through the bites of infected Aedes mosquitoes, principally Aedes aegypti.¹ It is a major public health problem in tropical and subtropical countries.² Over 2.5 billion people over 40% of the world's population are now at risk from dengue. Annually, the World Health Organization estimates that 50–100 million people are infected with dengue virus worldwide with estimated 500,000 cases of dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS) with about 12,500 deaths occurring.³ Many dengue fever (DF) cases are self-limiting but its complications like haemorrhage and shock can be life-threatening. If untreated, mortality from the complications of DF is as high as 20%, whereas if recognized early

and managed properly, mortality is less than 1%.⁴ There are three main laboratory methods to diagnose dengue infection: viral isolation in culture, detection of viral RNA, and specific IgM/IgG antibodies in paired sera. The gold standard is usually a combination of these methods.^{5,6} However, methods such as virus isolation and genomic RNA detection (PCR), need a specialized laboratory, well trained laboratory personnel and costly, which are not widely available in hospital settings. On the contrary, there are commercially available immunochromatographic and ELISA tests for the detection of IgM/IgG antibodies which give results within few minutes to hours. But, the detection of antibodies in a dengue infected person is only possible after 4-5 days of disease onset.⁷ Dengue NS1 antigen, a highly conserved glycoprotein, produced in both membrane-associated and secretion forms, is abundant in the serum of patients during the early stages of dengue infection.⁸ Several studies conducted revealed the importance of dengue NS1 antigen as a biomarker; these antigens can be detected before the formation of antibodies.^{9,10} NS1 antigen is detectable in blood from the first day after the onset of fever up to Day 9; and in the presence of IgM antibodies.¹¹ The main objective of this research was to compare the immuno-chromatographic test and ELISA for NS1 antigen, so as to improve the early detection of dengue in rural centers.

MATERIALS AND METHODS: In this study a total of 351 sera were collected from patients with suspected dengue infection. These patients were selected based on a clinical diagnosis of dengue infection and fulfilled the WHO case definition for dengue fever. The status of dengue infection in these patients was determined by serological detection of dengue IgM and IgG and detection of dengue NS1 antigen. All samples were tested using a commercially available immuno-chromatographic test and ELISA (Panbio for NS1, J. Mitra India for IgM and IgG antibodies) for NS1 antigen, IgM and IgG antibodies (J. Mitra, India). The test procedures were performed according to manufacturers' instructions.

RESULTS: Out of 351 samples tested, 70.94% (249/351) of the sera were found to be positive for Dengue virus infection based on the IgM antibody or IgG antibody or NS1 antigen or a combination of them.

COMBINATION OF DENGUE NS1 ANTIGEN AND ANTIBODY TESTS: The results of dengue NS1 antigen detection were compared to the results of the dengue antibody tests (IgM and/or IgG) and also compared both method rapid test and ELISA for antibodies and NS1 antigen. Of the 249 samples 42.16% (105/249) were positive for only IgM and/or IgG antibodies by ELISA and 40.56% (101/249) by ICT. Based on dengue NS1 antigen and/ or IgM and/or IgG tests, 57.8% (144/249) were positive for DENV infections by ELISA and 55.8% (139/249) by ICT. IgM and IgG dengue antibodies were found positive in 20.88% (52/249) of sample by ELISA. Only dengue NS1 antigen was detected in 26.90% (67/249) by ELISA and 26.10% (65/249) by ICT. See Figure 1.

COMPARISON OF DENGUE ICT AND ELISA TESTS: There was no significant difference found between detection of dengue infection by ICT and ELISA tests ($p > 1$) see Table 1.

DISCUSSION: The techniques of dengue serologic diagnosis which have been widely used are based on the detection of dengue-specific IgM/IgG antibodies by ELISA. The dengue-specific antibodies begin to appear only around fifth day of fever in primary infection.¹² Even in most

secondary infections, both the IgM and IgG type antibodies cannot be recorded before third day.¹³ So, there is a window period, both in primary and secondary dengue infection when only antibodies are tested. This window period can be reduced by using a highly specific and extremely reliable viral marker i.e dengue NS1 antigen, which is detectable in blood from the first day after the onset of fever, both in primary and secondary infections.¹⁴ In our study, of the 249 cases, 26.90% (67/249) were positive for only NS1 antigen. Considering very high specificity of NS1 it can be stated that we would have missed the diagnosis in 26.90% cases had we not included NS1 in the test panel. Datta et al and Shrivastava et al have shown that NS1 was positive in 140 out of 600 (23.3%) and 15 out of 91 (16%) cases respectively in their studies.^{15,16}

During the acute phase, the presence of IgM antibodies alone suggests primary infection and detection of newly formed IgM antibodies occurs after viremia ends or after fever subsides.¹⁴ IgM antibodies are detectable approximately 4 to 6 days after the onset of fever. By Day 5 of symptoms, 80% of cases have detectable IgM antibodies and 93-99% of cases have detectable IgM by Days 6 to 10.¹⁴ In this study 91.8% (147/249) of cases have detectable IgM by Days 6 to 10. Once IgM is detected, the level increases rapidly and appears to peak about 2 weeks after the onset of symptoms, then decreases to undetectable levels over 2 to 3 months. In primary infection IgG antibodies become detectable at 10–14 days and in secondary infection, IgG antibodies present at high levels before or simultaneously with the IgM antibody response. IgG antibodies increase to high levels within the first week of infection and decline slowly over 3 to 6 months. Among two antibodies, IgG is a less reliable marker in the diagnosis of dengue infection.¹² Both clinical and sub-clinical infections can produce IgG which may persist for several years affecting the interpretation of test results.¹⁴ It is highly likely that IgG levels could be higher in endemic areas because of bites from infected mosquitoes. However, dengue-specific IgM is a very good indicator of recent infection. It may also be detectable in secondary dengue infection.¹² Utility of antibody in the diagnosis of infections relies mainly on rising titres, especially in the endemic areas. However, repeat testing of cases, for the same infection, when the first test is negative or sending samples for determination of rise in titre is 'almost never' utilized in clinical practice. When NS1 is positive, there is no need of repeat testing as it is a highly specific marker of dengue infection. NS1 alone or in combination with either IgM or IgG was positive in 144 cases (57.83% cases) in our study

The present study also compared simultaneously the performance of two commercially available ELISA and ICT based test for the early diagnosis of dengue showing in Table 1. There was no “statistically significant” ($P > 0.001$) difference found between ELISA and ICT. This study has been carried out at a rural tertiary care teaching hospital and because of limited facility viral culture and RT-PCR not done. Therefore, applying gold standard tests in studies related to viral infections is out of reach of these centres. Dengue is an infection that is present in urban, semi-urban and rural areas. Our healthcare system is extremely resource poor. Top class technological backup is available only at few elite laboratories situated in big cities. In the peripheral centres of developing countries like India where the laboratory has to function without great technological backup and still is expected to provide reasonable opinion to the clinician in the management of infections like dengue, ICT could be helpful in early diagnosis of dengue infection as this test is almost equally sensitive as ELISA.

CONCLUSION: Our findings suggest that the NS1 antigen is a specific tool for diagnosing every clinically suspected case of Dengue fever on day 1. The addition of a dengue NS1 component to

ORIGINAL ARTICLE

the dengue detection test panel significantly improved diagnostic sensitivity above IgG and IgM antibody testing alone. Our study found no significant differences in sensitivities of ICT and ELISA tests. Immunochromatographic test being cost effective, and need less technical expertise especially in peripheral health care centres or laboratories that have limited resources is an excellent tool for detection of dengue fever.

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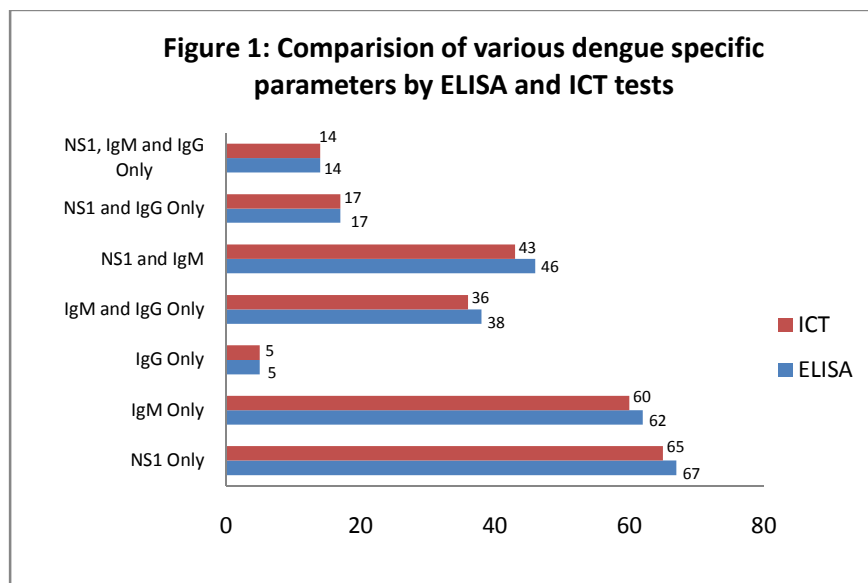
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Table 1: Comparison of Dengue ICT and ELISA tests

Result	ICT	ELISA
Positive	240	249
Negative	111	102

Number of Samples



“TO STUDY THE RELATIONSHIP OF ORAL HYGIENE AND GINGIVITIS WITH THE INFLUENCE OF TOOTH BRUSHING HABITS IN CHILDREN OF MEERUT DISTRICT”

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ABSTRACT: Oral hygiene as a means and an end is a relatively novel concept which has only attained tactic public recognition as a desirable cosmetic endeavor during this last century. Numerous factors may affect the distribution of plaque and gingivitis in the mouth. Of considerable importance must be the oral hygiene habits of each person, which will be influenced by compliance and dexterity with tooth cleaning methods. Most people exercise some measure of oral hygiene, and tooth brushing seems to be the method of choice providing thorough and regular cleaning. **AIMS & OBJECTIVES:** This present study was conducted to investigate the effect of different brushing habits on dental plaque accumulation and gingival health of children of Meerut district. **RESULTS:** The results of the study revealed that plaque index and modified gingival index was not affected by sex and residing status of the children. Toothbrush was observed to be the best brushing aid, followed by name datum and then finger. Further, it was found that children who used toothpaste as a dentifrice showed lesser degree of plaque and gingivitis as compared to children who used toothpowder and those who used no dentifrice. The scores were the highest in children who were using raakh as a dentifrice. Brushing once or twice daily proved to be the best frequency of brushing, followed by alternate days, occasionally and the highest for children who did not brush. It was observed that plaque was found to be directly related to gingivitis irrespective of the sex, residing status, type of brushing aid, dentifrice used and frequency of brushing. Therefore, it can be concluded that more school dental health education programs should be carried out, focusing on the need of tooth brushing using a suitable dentifrice at least once a day to maintain good oral hygiene.

KEYWORDS: Oral Hygiene, Gingivitis, Tooth brushing, Children

INTRODUCTION: ‘A clean tooth never decays’ was a forceful proverb in the early years of oral hygiene promotion. As we commence a new millennium the prospect of maintaining the natural dentition in relative health for a lifetime is a reasonable and achievable goal. There are several general reasons for this optimism; improved socio-economic status, better education, increased public interest in maintaining good oral health and better oral hygiene. Gingivitis is still prevalent, but less extensive and less severe than expected.

ORIGINAL ARTICLE

Early morphological and histopathological research disclosed that an intimate spatial relationship existed between dental plaque and the gingival tissues.¹

Bacterial plaque, the primary etiological agent in gingivitis and supragingival plaque formation, appears to be necessary for the initial colonization of the subgingival environment. Gingivitis is inflammation of the gingiva that does not result in clinical attachment loss.² Investigations show that marginal gingivitis starts in early childhood and its incidence and degree increase in severity in adolescence, whereas in the next decade, the incidence of gingivitis spreads insignificantly.³

The severity of gingivitis is often related to plaque accumulation which has been shown to be variable with age i.e. gingival inflammation in young children is milder than older children with similar plaque deposits.

Other factors may affect the intensity and severity of gingivitis in children, such as immunological, microbiological, and anatomic characteristics. Also the effect of demographic and socioeconomic factors on gingivitis has yet not been defined.³

Numerous factors may affect the distribution of plaque and gingivitis in the mouth. Of considerable importance must be the oral hygiene habits of each person, which will be influenced by compliance and dexterity with tooth cleaning methods.⁴

Gingivitis develops in individuals after 7 – 21 days in absence of personal plaque removal, providing strong evidence for recommending at least daily tooth brushing.⁵

Oral hygiene practices in India are deeply based on tradition and culture with use of indigenous substances being widely prevalent. Most people exercise some measure of oral hygiene, and tooth brushing seems to be the method of choice providing thorough and regular cleaning.⁶

Nowadays, wide variations exist in type of brushing aid used, tooth brushing technique, dentifrice use, frequency and time of tooth brushing. Individual tooth brushing habits are usually consistent. Factors affecting the efficacy of tooth brushing include the technique, frequency, duration, brush type and design and the dentifrice used.⁷ This present study was conducted to investigate the effect of different brushing habits on dental plaque accumulation and gingival health of children of Meerut district.

MATERIAL AND METHOD: The present study was conducted on a sample of four hundred and fifty nine child patients irrespective of sex and socioeconomic status between the ages of 8 – 14 years studying in various schools of Meerut district and visiting the O.P.D of Department of Pedodontics and Preventive Dentistry, Subharti Dental College, Meerut.

ASSESSMENT OF VARIOUS BRUSHING HABITS: A case sheet was prepared which was made to include the vital statistics of the child patient along with his dentition. All subjects were requested to answer a set of questions prepared to assess the oral health behavior of the child including the brushing activity such as frequency, brushing aid, dentifrice used, method of brushing and any other oral hygiene aid used.

EXAMINATION OF THE CHILD PATIENTS: The child patients were examined with a mirror and explorer in a sitting position. The evaluation or scoring was done on the entire dentition (whole mouth basis). The teeth were dried with an air syringe prior to the plaque index recording.

ORIGINAL ARTICLE

The plaque and gingival status of each child patient was assessed using Plaque Index (**Silness & Loe, 1964**)& Modified Gingival Index (**Lobene et al., 1986**)

The data was recorded according to the methodology and was put on statistical analysis to find the possible correlation amongst the different variables of study and to get a statistically significant result.

OBSERVATIONS: The children selected for this study were divided into various groups based on the sex, residing status, brushing aid, dentifrice used and frequency of brushing.

While assessing the significant difference between the sex, residing status, various types of brushing aids, dentifrice used and frequency of brushing, it was seen that plaque index and modified gingival index was not affected by sex and residing status of the children.

A significant difference was observed for various kinds of brushing aids used. Toothbrush was observed to be the best brushing aid giving relatively less scores for plaque and modified gingival indices, followed by neem datun, finger and the highest for children who did not brush.

Further , for the type of dentifrices used, it was found that children who used toothpaste as a dentifrice showed lesser degree of plaque and gingivitis as compared to children who used toothpowder and those who used no dentifrice. However the scores were the highest in children who were using raakh as a dentifrice.

Also, for frequency of brushing, statistically no significant difference was observed between those who used to brush once and twice daily. However, brushing twice daily proved to be the best frequency of brushing as it gave relatively less scores for plaque and modified gingival indices, followed by once daily, alternate days, occasionally and the highest for children who did not brush.

While finding correlation between plaque index and modified gingival index for various brushing aids, dentifrice used, frequency of brushing, sex and residing status, a positive correlation was observed between plaque indexes and modified gingival index for the sexes, residing status, various brushing aids, various dentifrices used and frequency of brushing

DISCUSSION: Oral hygiene and personal hygiene are about the cheapest form of preventive health measure. Though cheap, it is surprisingly one of the most ignored in practice especially in the under-privileged rural communities.

It has been shown that dental plaque is the predominant cause of gingivitis in man. ¹ The introduction of preventive dental care, including plaque removal, has been shown to decrease the level of gingivitis.⁷ Taani DS, Al-Wahadni AM, Al Omari M.⁸ in their study to evaluate the impact of toothbrushing on dental plaque concluded that more emphasis should be placed on proper oral hygiene. Wunderlich RC, Caffesse RG, Morrison EC, Temple HJ, Kerschbaum W⁹ concluded that tooth brushing has a therapeutic effect on naturally occurring gingivitis, enhanced by oral hygiene instructions.

The present study was conducted to investigate the effect of different tooth brushing habits on dental plaque accumulation and gingival health of children of Meerut district. It was seen that plaque index and modified gingival index was not affected by sex of the children. Okolo et al, ¹⁰ reported that there was no significant difference between the plaque indices of males and females. On the contrary, Barnie T James, Leske Gary S, Ripa Louis W¹¹ reported that females had a better oral hygiene as well as gingival status when compared with the males.

While assessing the significant difference between the residing status, it was seen that plaque index and modified gingival index was not affected by residing status of the children. There can be several general reasons for this; improved socio-economic status, better education, increased public interest in maintaining good oral health, increased capabilities on the part of the dental professionals in delivering state of the art preventive and therapeutic services and a strong and dynamic research enterprise able to convey new concepts and approaches to prevention and cure of disease.

Mechanical plaque control is the most effective method of controlling plaque and gingivitis.¹² Tooth brushing plays a pivotal role in the defense against plaque and gingivitis.¹³ Fernández L.B.F, Novaes B., Feitosa A.C.R, Novaes B.¹⁴ said that tooth brushing is still the most important factor in oral hygiene and maintaining gingival health. Toothbrush was observed to be the best brushing aid giving relatively less scores for plaque and modified gingival indices, followed by neem datum, finger and the highest for children who did not brush.

The use of natural products in the prevention and treatment of oral conditions has increased recently and could be of benefit to low socioeconomic level urban and rural communities.¹⁴ Chewing sticks (Neem Datum) may have a role to play in the promotion of oral hygiene.¹⁵ Selected clinical studies have shown that chewing sticks, when properly used, can be as efficient as toothbrushes in removing dental plaque due to the combined effect of mechanical cleaning and enhanced salivation.⁷ Evaluation of their effectiveness requires further research. Tooth brushing with a dentifrice is the most widely practiced form of oral hygiene in most countries. In our case toothpaste proved to be a better material for reducing plaque and gingivitis than the toothpowder. Raakh when used as a dentifrice gave the highest scores for plaque and gingival indices, even higher when compared to children using no dentifrice, which may be attributed to the presence of harmful micro organisms in raakh.

Early reports on the relationship between frequency of the toothbrushing and the state of oral hygiene were conflicting. It is now recognized that frequency of brushing is an important influence oral hygiene.¹⁶ In our study brushing once or twice daily proved to be the best frequency of brushing as it gave relatively less scores for plaque and modified gingival indices, followed by alternate days, occasionally and the highest for children who did not brush. The role of plaque in the etiology of gingivitis and periodontitis is well established. It was observed that plaque was found to be directly related to gingivitis irrespective of the sex, residing status, type of brushing aid, dentifrice used and frequency of brushing.

CONCLUSION: Based on the results of this study it was concluded that plaque and gingival health was not affected by sex of the children and residing status. Toothbrush was observed to be the best brushing aid, followed by neem datum and lastly finger. Toothpaste was observed to be the best dentifrice followed by toothpowder, while raakh was considered to be the least suitable dentifrice even worse than using no dentifrice. Brushing once or twice daily proved to be the best frequency of brushing as it gave relatively less scores for plaque and modified gingival indices, followed by alternate days and occasionally. It was observed that plaque was found to be directly related to gingivitis irrespective of the sex, residing status, type of brushing aid, dentifrice used and frequency of brushing. Therefore more school dental health education programs should be carried out, focusing on the need of tooth brushing using a suitable dentifrice atleast once a day to maintain good oral hygiene.

ORIGINAL ARTICLE

Table 1: Distribution of children according to Gender and Residing Status

GENDER				RESIDING STATUS			
MALES		FEMALES		RURAL		URBAN	
226	49%	233	51%	306	67%	153	33%

Table 2: Distribution of children according to Brushing aid used

TOOTH BRUSH	373	81%
FINGER	53	11%
NEEMDATUN	12	3%
DO NOT BRUSH	21	5%

Table 3: Distribution of children according to Dentifrice used

TOOTH PASTE	329	72%
TOOTH POWDER	92	20%
RAAKH	5	1%
NO DENTRIFICE	33	7%

Table 4: Distribution of children according to Frequency of brushing

ONCE DAILY	357	78%
TWICE DAILY	53	11%
ALT DAY	16	3%
OCCAISIONALLY	12	3%
DO NOT BRUSH	21	5%

ANALYSIS OF DONOR DEFERRAL IN BLOOD DONORS

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ABSTRACT: INTRODUCTION: A large number of blood donors are not able to donate blood successfully for several reasons, either temporarily or permanently. **AIM:** The present study was conducted to analyse the incidence and various reasons for deferrals. **MATERIALS AND METHODS:** The study was conducted at Medical College Hospital, Blood Bank during the period from January 2011 to December 2011. The study involved donors who have donated blood at outdoor voluntary blood donation camps and at the blood bank. Donors were selected by Medical officer. Information regarding the donor deferral was recorded. **RESULTS:** Three hundred (4.27%) donors were deferred. Among them 236 (78.66%) were VD and 64 (21.34%) were RD. In the present study majority (46%) of the donors deferred were between 18-28 years. Donor deferrals were tabulated into temporary and permanent. Temporary deferrals were 204 (68%) and permanent deferrals were 96 (32%). Among 204 (68%) temporary deferrals, the most common cause was anemia (34.31%), underweight (27.45%). Among 96 (32%) permanent deferrals, the most common cause was hypertension (48.96%). **CONCLUSION:** The donor deferrals can be reduced by creating awareness and educating the donors.

KEY WORDS: donor deferral, temporary, permanent, anemia, under weight

INTRODUCTION: A blood transfusion is a life-saving procedure in many instances and it requires an adequate supply of safe blood. Many measures have been taken to make the blood transfusion safe by the blood transfusion committee. The most important is the selection of blood donors by donor selection criteria.^[1] A large number of blood donors are not able to donate blood successfully for several reasons, either temporarily or permanently. Individuals disqualified from donating blood are known as 'deferred' donors. Blood donor deferral is a painful and sad experience for the blood donor as well as the blood center screening the donor. Deferring donors often leaves them with negative feelings, about themselves as well as the blood donation process. Additionally these donors are less likely to return for blood donation in future.^[2] A few studies in India in the past have provided different common reasons for deferral of whole blood donation highlighting differing demographic profile in different parts of the country.^[3]

AIM: The present study was conducted to analyze the incidence and various reasons for deferrals.

MATERIALS AND METHODS: The study was conducted at Medical College Hospital, Blood Bank during the period from January 2011 to December 2011. The study involved donors who have donated blood at outdoor voluntary blood donation camps and at the blood bank. Deferral by

self and repeat donors were not included in the study. Each donor was examined by Medical Officer based on detailed medical history and brief physical examination as per the criteria laid down by Director General Health Services and Drug's Controller of India.^[4] Detailed information on the donor deferred including the age, sex, cause of deferral whether temporary or permanent were recorded. The quantity of blood collected was 350ml from donors weighed > 45 kgs and 450 ml from donors who weighed > 60 kgs. All the donors were screened by CuSo₄ method for haemoglobin estimation (Hb%) and the cut-off was 12.5g/dl. The doubtful value for donors were confirmed by Shali's Haemoglobinometer method. Donors with systolic BP between 100 & 180 mm of Hg and diastolic BP between 50-100 mm of Hg were accepted for blood donation. An average of three measurements were taken for those not falling within this range of systolic or diastolic BP.

RESULTS: During the study period the total number of donors accepted for blood donation were 7015 both in the outdoor voluntary blood donation camp and at the blood bank. Voluntary donors (VD) were 5823 (83%) and relative donors (RD) were 1192(17%). Male donors were 6825(97.22%) and female donors were 190 (2.78%).

Of the total donors who were willing for blood donation, 300 (4.27%) donors were deferred. Among them 236 (79%) were VD and 64 (21%) were RD. In the present study majority (46%) of the donors deferred were between 18-28 years followed by 29-38 years (28%). The deferral among males were 196 (65.33%) donors and among females 104 (34.67%) donors as shown in Table-1.

The most common occupation among deferred were students (31%), professional (19.65%), unemployed (14.66%) and services (11%) as shown in Table-2.

Donor deferrals were tabulated into temporary and permanent as shown in Table-3 & 4. Temporary deferrals were 204(68%) and permanent deferrals were 96(32%). Among 204 (68%) temporary deferrals, males were 55.4% and females were 44.6%. Among males, the most common cause was under weight (30%), anemia (26.55%) and alcohol intake (21.24%). In females, anemia (43.96%), underweight (24.18%) and hypotension(12.09%) were the most common cause for temporary deferral. Among 96 (32%) permanent deferrals, males were 83(86.45%) and females were 13(13.55%). The most common cause among males was hypertension 47(54.22%) followed by unexplained weight loss 16 (1715.66%). In females asthma 12(30.77%) was the common cause for permanent deferral.

DISCUSSION: Adequate supply of blood is more important and it is also essential that the blood collection process does not harm either the donor or the recipient. This is achieved by donor selection criteria.^[5] The criteria is based on scientifically informed medical opinion and regulatory rules. Deferring donors protects both the blood donor and the recipient from harm. The rate and reasons of deferral differs from region to region and from one centre to other. Donor deferral rates in blood canters vary from 5 to 24% leading to huge losses in terms of available units for transfusion in the nation every year.^[6]

In the present study the overall deferred rate was 4.27% and the deferred rate was higher in males (65.33%) compared to females (34.67%). This was similar to that observed by Unikrishnan B ^[1](5.2%), Sundar P ^[3](6%), Agnihothri N^[5] (11.6%). The higher rate (8-15%) was reported by Chaudhary^[7], Lim^[2], Blumberg^[8], Ranveet.^[9]

In the Unikrishnan^[1] study the VD deferred was 22.80%, the findings was more in the present study (79%). This was mainly observed in the students (31%) and professionals (19.65%), who by virtue of their education are more aware of the importance of blood donation.

Students were the major donor population as they could be easily motivated and in the course could be retained for repeat VD.

Most of these deferred donors (74.33%) were 18-38 years which was less compared to Shalini Bahadur (89.7%) study.^[10] This highlights the fact that a sizeable proportion of youth in this part of the world are malnourished, reflecting the impact of low-socioeconomic status on the health of Indian youth. Donors above 60 years are not allowed to donate blood. Even otherwise it is rare to have a donor voluntarily coming to donate blood in our region. Where as in other countries there are many healthy voluntary blood donors >60 years of age who successfully donate blood. Garry et al^[11], advice elderly healthy individual to donate but limit donations to less than five per year or donors are advised to take iron supplement regularly to preserve reasonable amount of iron reserve.

Donor deferral was tabulated into temporary and permanent. Custer et al^[12] reported 68.5% temporary and 31.5% permanent deferral which was similar to the present study. The temporary deferrals were more than permanent deferrals. The three most common cause of temporary deferrals in females are anemia, underweight, hypotension. In males underweight, anemia and alcohol intake were the three most common causes. A number of other studies showed anemia as the most common cause like Naveen Agnihotri ^[5]56%, Arslan et al ^[12] 20.7%, Halperin et al 46%.^[13] Nearly two third of these anemic donors were females highlighting the prevalence of anemia in general population among females and it is very prevalent in a developing country like India and this is a significant cause for deferrals among donors who came forward enthusiastically for donation, but were unable to donate. These donors can be recruited back into the donor pool if managed properly. Similarly in another Indian study by Chaudhary^[7] low weight (32.3%) and low haemoglobin (18.6%) were the two most common reason for deferral.

Among permanent deferrals- hypertension was the common cause in males which was similar to Sundar P^[3] study. Two Indian studies report that history of jaundice was the common cause of deferral in Chandigarh and Lucknow.^[9,7]

Unsuccessful phlebotomy due to poor vein, double puncture, collecting less quantity was nil(0%).Whereas Sunder ^[3]reported 0.006% and Farrales^[15] reported higher rate of 0.5%.

In the present study the replacement donors had less deferral rate as compared to voluntary donors. This may be due to knowledge about the possibility of deferral and awareness of deferral criteria may be responsible for lower deferral rate in RD. Similar observation were made by Zou et al.^[16]

Analysis of donor deferral pattern indicates the impact of knowledge of deferral criteria in blood donors. The donor deferral rate can be reduced by educating the donors and providing information about the selection criteria. This results in better acceptability and there by less negative feeling about rejection in blood donation and more chance of future return.

CONCLUSION:This study showed that the incidence of donor deferral was 4.27% and most of the donors were young with the majority being students and voluntary donors than replacement donors. Temporary deferrals were more compared to permanent deferrals. The most common cause among temporary deferrals was anemia, underweight and hypotension. Hypertension was the commonest cause among permanent deferrals. The donor deferrals can be reduced by providing information and educating the donors. This reduces the negative feeling about blood donations and blood donor deferrals.

ORIGINAL ARTICLE

ACKNOWLEDGEMENT: I thank our Director, Principal, Superintendent, Professor and HOD of pathology, VIMS, Bellary.

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Table -1 : Total number of blood donors deferred by age & sex

Age (years)	Male	Female	Total
18-28	67	71	138(46%)
29-38	61	24	85(28.33%)
39-48	33	08	41(13.67%)
49-61	35	01	36(12%)
Total	196(65.33%)	104(34.67 %)	300(100%)

Table-2 Occupation of the blood donors deferred

	Male	Female	Total
Students	41	52	93(31%)
Professional	52	07	59(19.65%)
Agriculture	14	0	14(4.66%)
Labour	20	0	20(6.66%)
Services	33	0	33(11%)
Technical	13	0	13(4.33%)
Unemployed	22	22	44(14.66%)
Housewife	0	23	23(7.38%)
Others	02	0	02(0.66%)
Total	196(65.33%)	104(34.67%)	300(100%)

ORIGINAL ARTICLE

Table-3 Permanent deferral by age & sex

Causes	18-28 yrs		29-38 yrs		39-48yrs		49-60yrs		Total		Grand Total	%
	M	F	M	F	M	F	M	F	M	F		
Hypertensin	-	-	15	02	08	-	22	-	45 (54.22%)	02 (15.38%)	47	48.96%
Asthma	02	03	04	01	02	-	-	-	08 (9.64%)	04 (30.77%)	12	12.50%
Epilepsy	01	-	02	-	01	01	-	01	04 (4.82%)	02 (15.38%)	06	06.25%
Diabetes mellitus on insulin	01	-	02	-	03	01	-	-	06 (7.23%)	01 (7.69%)	07	07.29%
Polycythemia	-	-	01	01	01	-	-	-	02 (2.41%)	01 (7.69%)	03	03.13%
Unexplained weight Loss	-	-	05	03	02	-	06	-	13 (15.66%)	03 (23.08%)	16	16.67%
S/S suggestive of AIDS	02	-	02	-	01	-	-	-	05 (6.02%)	(0.00)-	05	05.21%
Total	06	03	31	7	18	2	28	01	83 (100%)	13 (100.00)	96	100%

Table-4: Temporary deferral by age and sex

ORIGINAL ARTICLE

Causes	18-28 Yrs		29-38 Yrs		39-48 yrs		49-60yrs		Total 204cases		Grand Total
	M	F	M	F	M	F	M	F	M	F	
Anemia	23	38	04	02	03	-	-	-	30 (26.55%)	40 (43.96%)	70(34.31%)
Underweight	18	22	16	-	-	-	-	-	34 (30.00%)	22 (24.18%)	56(27.45%)
Hypotension	-	02	-	09	-	-	-	-	(0.00)	11 (12.09%)	11(5.39%)
Fever due to bacterial viral,fungal infections	-	-	04	01	04	05	01	-	09 (7.96%)	06 (6.59%)	15(7.35%)
Lactation	-	03	-	-	-	-	-	-	(0.00)	03 (3.30%)	03(1.47%)
Menstruations	-	02	-	05	-	01	-	-	(0.00)	08 (8.79%)	08(3.92%)
Abortion	-	01	-	-	-	-	-	-	(0.00)	01 (1.10%)	01(0.49%)
History of icterus	01	-	02	-	-	-	-	-	03 (2.65%)	(0.00)	03(1.47%)
History of blood transfusion	-	-	01	-	01	-	-	-	02 (1.77%)	(0.00)	02(0.98%)
Typhoid fever	-	-	01	-	-	-	-	-	01 (0.88%)	(0.00)	01(0.49%)
Alcohol intake	18	-	02	-	04	-	-	-	24 (21.24%)	(0.00)	24(11.76%)
Drug intake	01	-	-	-	03	-	06	-	10 (8.85%)	(0.00)	10(4.90%)
Total	61	68	30	17	15	06	7	-	113 (100%)	91 (100%)	204 (100%)

SUTURELESS THYROIDECTOMY VASUCULAR CONTROL USING BIPOLAR ELECTROTHERMAL CAUTERY.

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ABSTRACT: INTRODUCTION: One of the routinely performed surgery is thyroidectomy. Rates of complications have decreased because of new technologies that are being invented like ligasure, harmonic scalpel and bipolar surgical diathermy. In this study we used bipolar surgical diathermy for thyroidectomy instead of ligasure and harmonic scalpel which are costly and available in higher centers only. **MATERIALS:** 40 patients with thyroid swelling attending surgical OPD between the period of 2010-2012 were selected. Proper preoperative workup was done local ethical committee approval was taken .thyroidectomy done using bipolar surgical diathermy .patients were reviewed for any complications following thyroidectomy like haemorrhage, hypocalcemia and recurrent laryngeal nerve palsy. **RESULTS:** Out of 40 patients who underwent sutureless thyroidectomy none of them had any primary, secondary or reactionary haemorrhage. One patient who underwent total thyroidectomy for follicular carcinoma had transient hypocalcaemia .

KEYWORDS: Thyroidectomy, bipolar surgical diathermy, hypocalcemia, recurrent laryngeal nerve palsy, haematoma.

INTRODUCTION: Thyroidectomy is one of the most common operations performed for thyroid diseases throughout the world and has an extremely low morbidity rate. First thyroid surgery accounts back to 12th century, but with extremely high mortality and morbidity for which it was not routinely performed (1). With the advent of general anesthesia and antisepsis mortality rates were reduced to 8% by 19th century. As the mortality rates decreased and surgical techniques have advanced the complications with thyroid surgery such as recurrent laryngeal nerve injury and hypocalcaemia became more apparent which are reported as 5-15% (2)(3). Rates of complications and morbidity in thyroid surgery have decreased greatly because of new technologies that are being invented like ligasure, harmonic scalpel and bipolar surgical diathermy.

Most of the studies have been performed comparing ligasure and suture knot tying or harmonic scalpel with conventional knot tying. In this study we choose to use bipolar electrocautery for performing thyroid surgeries that is sutureless thyroidectomy (Lobectomy, Near total thyroidectomy and Subtotal thyroidectomy)

MATERIALS AND METHOD: MATERIALS: 40 patients with thyroid swelling attended surgical OPD between the period of 2010-2012. Out of which 22 were solitary thyroid nodule, 4 multinodular goiter, 7 carcinoma and 7 thyrotoxicosis. A complete pre-operative work up which

ORIGINAL ARTICLE

included biochemical, ultrasonography, IDL , Fine needle aspiration cytology was performed and CT scan was done for FNAC proven cases of malignancy. At Local ethical committee approval was taken.

METHOD: After endotracheal intubation under general anaesthesia patient was positioned in reverse trendelenberg position. Kochers neck incision was made extending from one sternocleidomastoid to other. Upper and lower flaps raised upto thyroid notch and sternalnotch. Deep fascia was incised vertically in midline. Strap muscles cut at the junction of upper 1/3rd and lower 2/3rd border and retracted depending on the size of the gland. 2 tributaries of middle thyroid vein were identified and cauterized with bipolar electrothermal cautery. Superior thyroid pedicle was dissected all terminal branches of superior thyroid artery , inferior thyroid artery and other unnamed vessels were cauterized with bipolar cautery. Recurrent laryngeal nerve was identified on both the sides and preserved and parathyroid glands were identified at least on one side and preserved in all possible conditions. Proper haemostasis was achieved. Romovac suction drain kept in all cases. Strap muscles and deep fascia were sutured with vicryl, platysma was sutured with chromic catgut. Skin margins approximated with monocryl or 5-0 prolene . Suction drain was removed after 48 hours, patient was given a broad spectrum antibiotic for 5 days and discharged on 5th postoperative day. Follow up of the patients was after 1week, 6weeks and 12weeks for any recurrent laryngeal nerve palsy, hypocalcaemia.

RESULT: Out of 40 patients who underwent sutureless thyroidectomy none of them had any primary, secondary or reactionary haemorrhage. One patient who underwent total thyroidectomy for follicular carcinoma had transient hypocalcaemia and was treated with Vit D, calcium gluconate and on regular follow up it was normal. Now the patient is not on any medication.

DISCUSSION: Thyroid surgery can be performed safely with the appropriate technique, meticulous haemostasis and precise knowledge of the anatomy (4). Bleeding is a major complication of thyroid surgery both intraoperative and postoperative with the potential to cause life threatening airway obstruction, haemodynamic shock and even death. Sometimes it requires reoperation and may prolong the operation and stay. During thyroidectomy bleeding can obscure the operative field making safe dissection of recurrent laryngeal nerve and parathyroid gland difficult and prolonging the operation time. Effective vessel haemostasis can be achieved by suture knot tying technique or newer techniques of vessel haemostasis like harmonic scalpel, ligasure (alternative bipolar surgical diathermy system), clips, staples, tissue adhesives haemostatic agents/sealants, monopolar and bipolar surgical diathermy. The safest, most efficient and cost effective way to achieve haemostasis is hotly debated. During the last decade alternative techniques for improving safety and effectiveness of thyroidectomy have been developed. The conventional suture knot tying technique requires a large number of surgical ties and is time consuming ,decreases healing as well as increases wound infection, requires good exposure, injury to neighboring structures and foreign body reaction(5). Harmonic scalpel uses ultrasound technology to denature protein in the vessel wall and tissues upto 5mm thick leading to coagulation (6). A major criticism to harmonic scalpel comes from its cost, it is disposable and expensive (7). Ligasure vessel sealing device utilizes both electrical and elastin in vessel walls and tissue upto 7 mm in diameter to provide haemostasis(8).use of the

ligasure in thyroid surgery did not significantly reduce operative time, blood loss or complication rates compared with conventional knot tying but it increased operative cost(9). The use of metal clips has a wide acceptance among surgeons to achieve haemostasis. However they can cause significant interference with computed tomography and may have poor holding power(10). They can erode into important anatomic structures and may cause tearing of the adjacent vessels. A monopolar diathermy can be applied quickly and safely to vessels <2mm in diameter but the extension of the lateral thermal energy it produces cannot be estimated precisely so it can cause inadvertent thermal injury to adjacent structures(11). An alternative to conventional surgical diathermy is bipolar surgical diathermy. The path of the current can be constrained to pass only through the tissues being treated. This is achieved using a special forceps in which the two halves of the instrument are insulated from one another and in effect one half becomes the source of current and the other destination. A small blood vessel gripped between the jaws will be coagulated whereas there will be no damage to the adjacent structures, most of the modern diathermy machines support the use of bipolar probe without modification unlike ligasure and harmonic scalpel in which the machine is very costly.

CONCLUSION: The use of bipolar surgical diathermy is a better choice for thyroidectomies as compared to other techniques due to its cost effectiveness, less intraoperative and post operative complications rate.

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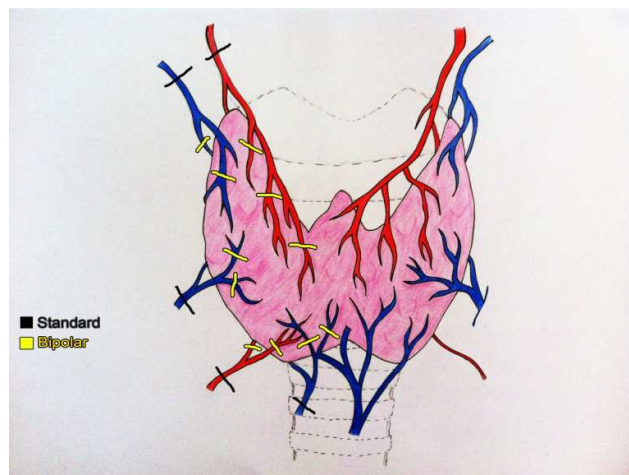
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Photograph showing recurrent laryngeal nerve



Schematic diagram showing difference between standard knot tying and bipolar surgical diathermy

ASSOCIATION OF HBsAg WITH SEVERE MALARIA - FACT OR FICTION?

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ABSTRACT: India lies in the endemic belt of PF malaria. Annually we are faced with regular outbreaks of severe malaria with its attendant adverse effects on public health in the North-East also. Owing to the diverse geographic, sociopolitical, economic, ethnic and cultural characteristics, this region is also ideal for future “epidemics” of potentially dangerous consequences of HBV infection e.g in Arunachal Pradesh in particular. Epidemiologically, a significant serological association between HbsAg positivity and severe malaria has been reported recently from Africa(Gambia). But, the multiple factors predisposing to severe malaria, and those influencing the progression of HBV infection have not been elucidated properly. It was postulated that the liver stage parasites are not properly cleared due to concurrent HBV infection of the hepatocytes. Inducible Genetic mutations protective in nature may be a factor. Similarly, those who are vaccinated against HBV are reported to suffer from malaria in South Asia. However, it is premature to draw any definite conclusions as our personal experience give us results to the contrary.

KEYWORDS: Protection from malarial complications, HBsAg, Severe malaria, Malaria & Hepatitis-B co- infection , Protective genetic mutation

INTRODUCTION: Malaria has been known to occur in India since ancient times ¹. Malaria, especially due to Plasmodium falciparum (PF) remains a leading cause of mortality and morbidity of the human race primarily due to the increasing inability of the insecticides and chemotherapeutic agents we use to eliminate the vectors and the parasite. In addition to cerebral malaria, non cerebral complications like severe anemia, acute renal failure and jaundice are being also increasingly seen and adding to the problems.

Hepatitis B (HBV) infection is an important global public health problem with nearly 400 million carriers. Regions like South-East Asia and sub-Saharan Africa fall in high endemic zones for this infection ². Similarly, the Indian population is also in the high-risk category. The clinical outcome varies widely ranging from asymptomatic, subclinical, self-limiting disease to endstage liver disease and hepatocellular carcinoma.

The North-Eastern part of India lies in the endemic belt of PF malaria. Annually we are faced with regular outbreaks of severe malaria with its attendant adverse effects on public health in our State. Owing to the diverse geographic, sociopolitical, economic, ethnic and cultural characteristics, this region is also ideal for future “epidemics” of potentially dangerous consequences of HBV infection. The multiple factors predisposing to severe malaria, like the

REVIEW ARTICLE

ones influencing the progression of HBV infection have not been elucidated properly. However, there have been reports of association of HbsAg carriage with severe malaria³.

PATHOGENESIS OF THE SEQUELAES OF SEVERE MALARIA: Although cerebral malaria is still the leading cause of mortality in complicated/severe malaria, still one must be aware of atypical or extracerebral forms⁴ especially the hepatitis and/or renal complications.

Genesis of severe malaria depends upon a complex interplay of the infection and several host factors. There is no absolute or complete infection immunity in malaria^{5,6} and the level of parasitemia does not always strictly correlate with the severity of the disease⁷. The most prominent feature in cerebral malaria which is traditionally the commonest severe form encountered in many parts of India, is a dense parasite sequestration in the cerebral capillaries brought about by cytoadherence to endothelial cells and other noninfected RBCs^{8,9}. In severe forms other deep organs may be involved by the same process producing a variety of organ dysfunctions.

GENERAL DETERMINANTS OF THE SEVERITY OF MALARIAL INFECTION: Efforts to find out the influencing factors – both genetic and environmental, modifiable and unmodifiable—which can explain some aspects of the variable response to malaria as regards its severity have been going on. In highly endemic areas innate or nonacquired immunity to resist severe malaria are known to exist which depend on genetic constitution of the residents in such regions. Hemoglobinopathies like alpha/beta thalassemia, sickle cell trait, glucose-6-phosphate dehydrogenase deficiency and absence of duffy blood group antigen Fy(a-b-) are some examples^{1,10,11,12,13} suggesting the existence of genetic resistance to malaria.

Because the parasite during its developmental stages presents a large number of antigens to the host immune system, cytokines (e.g. TNF-alpha) and new parasite strains may play a role in triggering severe malaria^{14,15}. In addition, PF secrete a number of exoantigens which may induce both protective and potentially harmful immunopathological reaction in humans¹⁵.

RELATIONSHIP WITH HbsAG WITH SEVERITY OF MALARIAL INFECTION: Epidemiologically, a significant serological association between HbsAg positivity and severe malaria has been reported recently³ from Africa (Gambia). It was postulated that the liver stage parasites are not properly cleared due to concurrent HBV infection of the hepatocytes. But in our observation of 303 consecutive complicated malaria cases over a period of 7 years we could not find any HbsAg carrier state in them. According to others also, this association may not be as significant as that found between HbsAg and other diseases like tuberculosis or even rheumatoid arthritis^{16,17}.

DOES HBV VACCINATION PROTECTS AGAINST SEVERE MALARIA?: If this association is true, then people with HBV vaccination should be at a lesser risk of contracting malaria and its severity later on. But in Africa and Thailand, it was shown that adults and children vaccinated with recombinant HepatitisB vaccine, when compared to unvaccinated controls, had similar rates of PF infection and related morbidity, suggesting that absence of HBV carriage may not prevent the consequences of PF infection^{18,19}. Vaccines against malaria are at different stages of development and the perfect one still eludes us. A sporozoite specific antigen of PF is the Pfs16. It was found that, when fused with HbsAg to form a protein (Pf16-S) in yeast cells by recombinant method, they formed hybrid particles of a size similar to those present in human

REVIEW ARTICLE

sera after infection with HBV ²⁰. It was also observed that, in HBV infection, HbcAg forms an important target for antiviral immunity. Epitope insertion at an immunodominant internal site of HbcAg reduces the HbcAg immuno-antigenicity, but it greatly enhances the immunogenicity of the inserted foreign epitopes. This has been used as a carrier moiety to express the circumsporozoite antigen (CS) of PF and form purified hybrid HbcAg-CS proteins. This has been found to protect against experimental PF infection in mouse, possibly by priming specific T-cells ²¹. Importantly, it was also found that, a pre-existing immunity to HbcAg did not alter the immunogenicity of this hybrid HbcAg-CS. Similar trials in humans involving hybrid HbsAg-CS plus an adjuvant was also found to protect against PF malaria ²². These findings would suggest that the association between HbsAg carriage and development of severe malaria is contradictory in the sense that a part of the HBV may in future help us protect against malaria itself. But, it must also be remembered that as in case of most microorganisms, a large number of polymorphic genes and HLA variation may influence the susceptibility or resistance to malaria ²³. Polymorphisms in MHC class I and II loci are of particular interest ²⁴ and it has been reported that the common HLA antigens in Western African population afford protection against severe malaria¹². In HBV carriage, the reduced level of HLA class I antigen expression on hepatocytes may explain an increased susceptibility to severe malaria. Two HLA-DR13 alleles HLA-DRB1*1301 and*1302 have been known to be associated with resistance to severe malaria and chronic HBV infection ²⁵.

In this backdrop, whether malarial infection induces genetic alterations or mutations to produce or protect against severe malaria in different geographical locations in absence or presence of HbsAg remains to be clarified. We do get a lot of malaria patients annually. Genetic variations in our region needs to be studied in this regard to establish the link(s), if any, of HbsAg carriage with severe malaria because, our genetic constitution may differ from other malarial endemic areas of the world where these links may supposedly exist.

CONCLUSION: As reported from Africa, a study does show an association of the severity of malaria with HbsAg status of the patients. Its premature to draw any definite conclusions as our personal experience give us results to the contrary. We had studied 303 patients with severe Pf malaria in our institute and none were positive for HbsAg.

Susceptibility to malaria is as variable as the disease expression and its severity. Sometimes we encounter extracerebral complications more frequently than the hitherto more common cerebral types in complicated malaria. Many aspects of malarial immunology are still unexplained. Genetic, environmental and other factors which are as yet unknown to us can help us in future to understand this infection and its outcome in different ethnic groups. As the disease is quite common in our part of the country, further works may be taken up to probe the genetic influences on the natural history of both chronic and acute malarial disease.

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CASE REPORT

“CONGENITAL FACIAL PALSY” - A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT: Congenital facial paralysis or facial paralysis at birth may be partial or complete. It may be idiopathic in nature or secondary to either birth trauma, tumors or other intrauterine environmental anomalies. Prompt diagnosis and appropriate timing of surgical intervention would improve quality of life if not complete functional restoration. Present article reports one such 60 years old male still waiting for treatment.

KEY WORDS: Congenital facial paralysis, Bells palsy, timely surgical intervention.

CASE REPORT: A 60 year old male patient reported to our dental college with a chief complaint of generalized dentinal hypersensitivity. No relevant family, medical or dental history was found. No habit of tobacco abuse in any form was reported. On detailed clinical extra oral examination patient exhibited typical signs and symptoms of unilateral bells palsy that are inability to wrinkle the forehead and raise the eyebrow on right side and in an attempt to close eyelid, the eyeballs roll upwards while portion of white sclera is seen –Bells sign. Inability to close the eye, increased lacrimation, conjunctivitis, corneal damage, inability to blow the mouth, constant drooling of saliva from corner of the mouth and asymmetry on smiling were the other signs noticed. Apart from these classical features he had scrotal tongue. He remembers as having this deformity from childhood but was unaware about any obstetrical trauma during birth.

Patient was explained surgical options like eye closure with implants, reanimation with nerve and muscle grafts to restore functions of facial muscles though partially but failed to turn up for treatment for unknown reasons.

DISCUSSION: Facial nerve, the seventh cranial nerve, is a mixed motor and sensory nerve. It supplies structures of second branchial arch and thus chief motor nerve for muscles of facial expression¹. Facial paralysis may be partial or complete, unilateral or bilateral, lower face or

CASE REPORT

upper face and or combination of these. Congenital facial paralysis could be idiopathic in nature or secondary to birth trauma, tumors or other intrauterine environmental anomalies. Any injury to facial nerve from its origin in caudal pons to peripheral branches can cause serious changes in facial expressions². This in turn causes social and mental trauma^{3,4}

Moebius syndrome also known as congenital oculo-facial paralysis or congenital facial diplegia is a full blown syndrome involving bilateral facial paralysis, paralysis of the lateral rectus or 6th abducens nerve, tongue hypoplasia, mental retardation, absence of the pectoral muscle, syndactyly and brachydactyly.^{5,6} Others conditions that are associated with facial paralysis are Pseudo-mobius syndrome⁷, hemifacial microsomia⁸, Hypoplasia of depressor anguli oris syndrome also known as Cayler syndrome or asymmetrical crying facies⁹ and CULLIP syndrome or Congenital lower lip palsy.⁶

Hereditary congenital facial paralysis is a rare unusual condition. Johnson-McMillan syndrome is one rare autosomal dominant condition associated with facial paralysis and multiple truncal café-au-lait spots, hyposmia, poor growth and development, microtia and mental retardation¹⁰.

Certain cranial bone anomalies are associated with facial paralysis secondary to compression of facial nerve at various areas through its course.

- (a) Cranial diaphyseal dysplasia involves thickening of all the cranial bones, with facial paralysis, blindness, mental retardation, seizures and death usually by second or third decade¹¹
- (b) Dominant osteopetrosis involves hyperostosis of the petrous bones with secondary cranial palsies of nerve II, III, VII and an autosomal dominant condition¹²
- (c) Hyperostosis corticalis generalisata involves hyperostosis of the mandible, cranial base, facial palsy, blindness and deafness and an autosomal recessive condition¹³.

Other complex syndromes where facial paralysis is expressed in various degrees of intensity as a part of multiple syndromes are Treacher Collins syndrome, CHARGE syndrome, FSH- fascio-scapulo- humeral dystrophy, Melkersson syndrome.

Treacher Collins syndrome or Mandibulofacial dysostosis (also known as Franceschetti-Lwalen-Kline syndrome) is autosomal dominant deformity of first and second branchial arches¹⁰. It is usually bilateral, with antimongolid obliquity of the palpebral fissures, notched lower eyelids coloboma of iris, ovoid orbital apertures, micrognathia, hypoplasia of malar and mandibular bones, large mouth, malocclusion, deformity of external (and occasionally inner ear), deafness, preauricular sinuses, dwarfism, cardiac and skeletal defects and anomalies of upper airway and varying degrees of facial paralysis.¹⁴

The CHARGE syndrome is a complex autosomal dominant deformity in which mnemonic stands for coloboma, heart disease, atresia chonal, retardation of mental and skeletal growth, genital hyoplasia and ear deformities¹⁵.

FSH- fascio- scapulo- humeral dystrophy is an autosomal dominant condition associated with weakness of face and shoulder muscles and the legs, plus hearing loss¹⁶. CBPS, congenital bilateral perisylvian syndrome, involves weakness of facial and pharyngeal muscles and muscles of mastication, of variable severity. There can be dysarthria to no intelligible speech, mental retardation and epilepsy¹⁷.

TREATMENT: The correction of facial asymmetry in congenital facial palsy presents a challenging problem for reconstructive surgeons. Patients with chronic facial palsy first need an

CASE REPORT

exact classification of the etiology.¹⁸ A standardised clinical examination, if necessary MRI imaging and an electromyographic examination allow determination of the severity of the palsy and the functional deficits. Considering the patient's desire, age and life expectancy an individual treatment plan can be made.

Surgical treatment is targeted at achieving 3 main objectives, eye closure and protection of the globe, oral continence and spontaneous animation. Eye closure can be achieved through many surgical procedures like implantation of gold weight in upper eye lid for gravity closure. Various types of springs and magnetic implants which reproduce passive blink reflex have been tried but have inherent problems of fixation and erosion through skin.¹⁹

Reanimation technique using cross facial nerve grafts have been tried with good results.²⁰ Cross facial nerve graft as preliminary procedure followed by functional muscle transplant after nerve has regenerated across the face to the paralyzed side is most preferred. Functional muscle transplant is done mostly with temporalis muscle and fascia lata but to a lesser extent with platysma and masseter. Temporalis muscle transposition is a single-stage procedure, easily adapted for the pediatric condition of congenital facial paralysis.²¹ The gracilis muscle free transfer can also be considered as a safe and reliable technique for facial reanimation with good aesthetic and functional results.²² In long standing cases results of microsurgical nerve anastomosis are unfavorable due to atrophy of the facial muscles.²⁰

CONCLUSION: Congenital facial palsy requires multidisciplinary approach with Neurologist, Plastic surgeon, Maxillofacial surgeon, Otolaryngologist and Physiotherapist. Early surgical intervention (three and a half years or earlier) to correct facial expression with nerve grafts and muscle repositioning have poor to acceptable results. Long term follow up of the patient by surgeons and the physiotherapist is required for better results.

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Fig 1: Patient of congenital facial palsy

CASE REPORT



Figure 2: Patient of congenital facial palsy with fissured tongue.

REVIEW ARTICLE

VISTA OF CLEFT LIP AND PALATE IN INDIA

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ABSTRACT: Congenital craniofacial anomalies like orofacial clefts are of concern for the entire health organisation all over the world. World Health Organisation (WHO) has started its own surveys and is analysing the data available from various countries. WHO has standardised the process of collection of data and has provided a multidisciplinary approach for the treatment of such cases. Surveys, research and application of multidisciplinary treatment strategies are successful on the urban Indian population but a lot needs to be done in terms of rural areas of India (which constitutes 70% population of India) and is posing a serious challenge of overall objective of health for all.

KEYWORDS: Cleft lips & Palate + Craniofacial anomalies

INTRODUCTION: Cleft of lip, hard and soft palate are the most common congenital abnormalities of the craniofacial structure. Worldwide incidence of cleft lip and palate is 1 in 600. ⁽¹⁾ The overall worldwide prevalence of cleft lip with or without the cleft of palate is 9.92 per 10,000. The prevalence of cleft lip is 3.28 per 10,000, and that of the cleft lip and palate together is 6.64 per 10,000. ⁽²⁾ Lowest incidence occurs in Native American tribes of Montana, USA, which is 1:2076. ⁽³⁾

Indian sub-continent still remains one of the most populous areas of the world with an estimated population of 1.1 billion in India alone. The Approx birth rate is estimated to be 24.5 million births per year and prevalence of clefts cases are somewhere between 27,000 and 33,000 cases per year. Inequalities exist, both in access to and qualities of cleft care with distinct differences among urban versus rural areas. Due to this inequality along with lack of awareness had lead to the accumulation of untreated clefts of the lip and palate leading to a significant health care problem in India.

The term cleft lip and palate inadequately describes the potential complexities of the deformity which may involve nose, lips, alveolus or palate. As a consequence breathing, appearance, dentition, dental occlusion facial growth, speech and hearing can all be affected

REVIEW ARTICLE

leading to psychosocial implications.⁽⁴⁾ It may not be the end of life but for children suffering from cleft problem, it goes beyond the obvious disfigurement of face to repeated infections, social stigma, and mental impairment that affects the speech, hearing, and dentition development or dentition as a whole. Such children are often misbehaved about their cleft-related problems such as speech, teeth and lip appearance etc which results in lower level of confidence among such children.⁽⁵⁾ Research has shown that normal children are considered to be brighter having more positive social behaviour, socially more accepted than those children suffering from cleft diseases. These children suffer with emotional "burn out" in adolescence. Therefore, it has been suggested that these patients should also be included in national policies for integration of handicapped people, in agreement with programs of human rights, establishing a collaborative action between state and society. This would assure their inclusion in the socioeconomic and cultural context and equal opportunities in society, without privileges or paternalism.⁽⁶⁾

Studies have shown association of clefts disease with haematological abnormalities such as anemia, eosinophilia and defects of the clotting mechanism. ⁽⁷⁾ A common clinical observation among children with cleft palate is high prevalence of recurrent upper and lower respiratory tract infection.⁽⁸⁾⁽⁹⁾

Indian sub continent being a geographically and economically different region than others, the demographic, prenatal and clinical profile of the clefts cases found in this region also differs. The condition in tropical countries like India becomes even worse due to poverty and illiteracy. India being economically a developing country is expanding the medical facilities available in the rural area. The various geographically difficult regions such as mountainous region of North and North-eastern India and plains of the Central Indian and the Southern region have diverse culture, religion and living standards. Due to insufficient, ineffective and disproportionate penetration of health care facilities the population at large have suffered a lot in terms of basic health care facilities. However certain NGOs and government agencies by means of various health projects have done excellent work but still lot of rural masses are deprived of quality and good health care. In addition, due to lack of awareness and illiteracy rate, the patients of cleft remain untreated or misguided by some quacks. ⁽¹⁰⁾

DOCUMENTATION OF CRANIOFACIAL ANOMALIES AND CLEFT LIP AND PALATE IN INDIA

India is one of the many countries of the world where documentation of birth anomalies is incomplete or not done. Efforts and hard work of certain NGOs and government health organisations has lead to an improvement in terms of health care needs, social and economical upliftment of Oro-facial Cleft (OFC) children but the problem is aggravated manifold due to unavailability of reliable and complete record of cleft cases statistics because of want of proper infrastructure and also due to poor association and non sharing of data recorded by various agencies dealing with craniofacial anomalies in India. It is well known fact that in many parts of India the parents of a child born with a cleft have no access to counselling on the care and treatment modalities of the disease affecting their children. Cleft lip and palate may be perceived to be a life threatening abnormality by such parents and also there is less awareness of the fact that clefts cases can be surgically repaired with considerable success both aesthetically and functionally. The lack of knowledge and resources results in unacceptable delay in seeking and receiving adequate medical care of such cases, due to which, many infants suffering from OFC die of malnutrition or infection. This grim situation is further compounded by failure of healthcare authorities to recognize craniofacial anomalies as a notifiable disease.⁽⁴⁾

REVIEW ARTICLE

From the facts presented above it becomes important that the issue of registering of cases of birth deformity is taken seriously in India. Various studies on cleft cases should be performed along with collection of data from different centres covering the various geographical and economical section of India, presence of consanguinity and high and low incidence areas as noted in previous studies. The agency entrusted with the task of registering of cases should establish network and communication with various neonatal units present in the different cities which are routinely involved in the collection of statistics of the newborns. In each center, a medical doctor and a social worker should work together for diagnosing and collection of appropriate information and data regarding birth anomalies.⁽²⁾ They should also liaise and collaborate with other medical centres within their area of work for collection of data. Craniofacial anomalies including cleft lip and palate would be a sub-set of the data collected, and the protocols used should be governed by the guidelines as issued by the WHO.⁽²⁾

MULTIDISCIPLINARY APPROACH AND STATUS OF SURVEYS IN INDIA: It is widely recognized that the optimum approach to the treatment of children born with cleft defects, either of the lip or palate, is a multidisciplinary approach as the treatment requires combined efforts from a paediatrician, orthodontist, specialist nurse, cleft surgeon, speech therapist and ear, nose and throat specialist (ENT) and because of which there is a need to provide the best possible collective expertise so as to ensure that correct and proper treatment interventions are carried out at the appropriate time to result in best possible functional and aesthetic result.⁽²⁾

Multidisciplinary treatment approach is the need for treatment of OFC children but such a scenario is best available in urban area while its application in rural area is still debatable due to lack of facilities available. Due to increased awareness Indian researchers have also started carrying out study and research on OFC children collecting data from various regions of the country. Various studies have shown that due to improvement of economic condition, literacy rate and more importantly the improvement in health care infrastructure are resulting in better care of cases suffering from cleft disease. Situation has also shown marked improvement due to the involvement of the non-governmental organizations in providing quality health care to the general masses especially to the weaker sections of the society is rapidly changing the cleft care scenario in the country. But despite the general improvement of the environment there is lack of interdisciplinary treatment approach at majority of the centres, and hence there is a need for better and effective collaboration among the specialist for the health care needs of the cleft cases.⁽¹¹⁾ Consanguineous relationship and illiteracy rate among the rural masses has also resulted in a situation of increased developmental deformity as well as inefficiently handling of the cleft cases in India.⁽¹²⁾⁽¹³⁾

Many researches through their studies have revealed the genetic complexity in Indian children suffering from oral cleft lip and palate.^(14,15,16,17,18) India being one the fastest developing country is bubbling with young and enthusiastic researchers who are struggling hard to find the genetic reasons along with the environmental effects resulting in oral clefting in Indian population. Surveys of rural and urban Indian population and statistical analysis and evaluation of the data are the main areas of concern, as these are also in developing state but are progressing positively with the help of the government health organisations together with certain NGOs and many researchers.

REVIEW ARTICLE

ENVIRONMENTAL FACTORS: Epidemiological and experimental evidences suggests that environmental risk factors such as maternal exposure to tobacco, tobacco smoke, alcohol, poor nutrition, viral infection, improper medications, and teratogens at the workplace and home in early pregnancy are some of the important etiological factors. The role of maternal nutrition and, multivitamins in particular, in orofacial clefts cases remains unclear. Furthermore, assessments of dietary intake or biochemical measures of nutritional status of OFC cases are challenging and often not available among the many impoverished populations suffering from the highest rates of orofacial clefts disease. The main environmental factors which has been reported to possibly increasing the risk of orofacial clefts cases is tobacco smoking,⁽¹⁹⁾ alcohol consumption,⁽²⁰⁾ solvents⁽²¹⁾ and agricultural chemicals.⁽²²⁾ Certain types of anti-epileptic drugs have also been reported to increase the risk.⁽²³⁾ It is, however, an established fact that the magnitude of the risk of recurrence of orofacial clefts to siblings.⁽²⁴⁾ increases after two or more affected siblings and is greater than that predicted by the familial aggregation of environmental risk factors. If measure of genetic susceptibility are not taken into account in epidemiological studies, measures of the relative risk of a disease associated with an environmental factor can be diluted considerably.⁽²⁵⁾

GENETIC FACTORS: There are two types of CL-P: syndromic and nonsyndromic. Nonsyndromic CL-P represents almost half of facial malformations and could be familial. Nonsyndromic cleft lip with or without cleft palate (CL-P) is one of the most frequently occurring congenital malformations among live births. This prevalence varies widely, depending on the ethnicity and geographic location of the population, ranging from 1 in 300 to 1 in 2,500⁽²⁶⁾ In the United States, it affects 1 in 700–1,000 newborns each year and is the fourth most common birth defect. In India, cleft lip/palate occurs in nearly 1 in 500 live births and the majority of these defects are not corrected either surgically or asymptotically.⁽²⁷⁾ Although Asians have the highest rate of orofacial clefts (OFCs) at birth; majority of the genetic studies have been conducted on white population. OFC may be included as one of the manifestations in more than 400 recognised syndromes. Some of the common syndromes and/or anomalies associated with clefting include Apert,⁽²⁸⁾ Meckel,⁽²⁹⁾ Treacher Collins,⁽³⁰⁾ and van der Woude syndromes.⁽³¹⁾ Dental anomalies such as supernumerary, hypoplastic, or congenitally missing teeth and malocclusion are common in patients affected with CL-P.

Orofacial clefts present as part of the phenotype in over 600 specific genetic syndromes are more commonly in association with isolated CP.⁽³¹⁾ The proportion of CL/P associated with specific syndromes has been reported to be between 5% to 7% ⁽³²⁾ The concordance rates for CL/P is higher in monozygotic twin pairs.⁽³³⁾ there has been familial clustering and concordance in twins of CL/P and CP and are specific for each defect, and therefore the defects are considered to be etiologically heterogeneous. ⁽³⁴⁾ There exists a male preponderance in CL/P along with predominance of cleft affecting the left side ⁽³⁵⁾. $TGF\alpha$ ⁽³⁶⁾ and $MTHFR$ ⁽³⁷⁾ genes have been amongst the most intensively studied variants over the years. However, the results are characterized by their inconsistency, reflecting the fact that further investigation of gene-disease associations and related interactions is required to be done.⁽³⁸⁾

An interesting recent finding is that the gene, IRF6, the gene implicated in Van der Woude syndrome has been shown to play a strong role in the isolated form of clefting,⁽³⁹⁾ and a number of other independent studies in a range of different populations and ethnic groups have reported this finding.^(40,41) Other examples of gene variants involved in syndromic forms of CL/P with a Mendelian mode of inheritance producing phenocopies of non-syndromic CL/P include

REVIEW ARTICLE

Kallmann syndrome (FGFR1),⁽⁴²⁾ ectrodactyly-ectodermal dysplasia/clefting (TP63),⁽⁴³⁾ X linked ankyloglossia/clefting (TBX22),⁽⁴⁴⁾ Gorlin Syndrome (PTCH),⁽⁴⁵⁾ and heterozygotes for the Margarita Island clefting syndrome (PVRL1),⁽⁴⁶⁾ The implication is that these genes might harbour a mutation that could cause or modify the expression of isolated cleft lip and /or cleft palate.

GENE-ENVIRONMENT INTERACTION: In the light of the foregoing discussion, it seems plausible that common genetic polymorphisms are modifiers of the relationship between environmental and lifestyle factors and orofacial clefts. Hence, there may be population subgroups which have a particularly high or particularly low risk of clefts due to a combination of genetic susceptibility and exposure. Genetic polymorphisms involving the metabolism of alcohol, agents in tobacco and smoke as well as those involved in nutritional metabolism may be relevant to orofacial clefts. Hypotheses can be tested if appropriate information on these factors is collected retrospectively from the affected families. One of the main reasons for the difficulty in determining the aetiology of non-syndromic clefts is that it is polygenic multifactorial, with genetic predisposition to environmental factors being important aetiology.⁽⁴⁷⁾ Because of the potential public health benefits, numerous studies have been carried out to examine possible interactions. These include those between: TGF α (with smoking⁽⁴⁸⁾ and vitamin supplements),⁽⁴⁹⁾ TGF β 3 (with smoking, alcohol), MSX1 (with smoking, alcohol),⁽⁵⁰⁻⁵¹⁾ polymorphisms influencing xenobiotic metabolism and smoking,⁽⁵²⁻⁵⁵⁾ occupational exposures,⁽⁵⁶⁾ maternal medication usage,⁽⁵⁴⁾ retinoic acid receptor alpha (RARA) polymorphisms, maternal intake of vitamin A,⁽⁵⁷⁾ polymorphisms influencing folate metabolism (MTHFR, RFC) and maternal folate intake.^(50,58-60)

At a WHO consensus meeting in December 2004, a collaborative research pooling initiative was established through the WHO International Collaborative on Craniofacial Anomalies Project (<http://www.who.int/genomics/anomalies/cfaproject/en/#mtg>) to undertake meta- and pooled analyses of studies. Collaborative efforts with different populations, ethnic groups, gene pools and environmental exposures across the world will assist in determining the multiple genes that modulate the effects of an exposure.⁽⁶¹⁾ The principles of genetic Mendelian randomisation can be employed to aid in the identification and understanding of environmental factors in disease⁽⁶²⁾

FUTURE OF CLEFT LIP AND PALATE IN INDIA: India, 1871 being one of the first documents to provide information on prevalence of a range of disabilities and diseases such as leprosy, blindness, deafness and insanity. (One of the first documents to provide information on prevalence of disability and disease in India such as leprosy, blindness, deafness and insanity was documented in 1871). Since then India has made significant progress in combating infectious disease through improvements in sanitation, childhood nutrition, vaccination and other public health initiatives; and as a result, genetic disorders have assumed greater importance.

Based on the National Family and Health Survey, 1992-1993 (NFHS),⁽⁶³⁾ consanguinous marriages are uncommon in the Northern, Eastern and North Eastern states and its influence on diseases has not been quantified, with recessive genetic disorders being one example of an influence of consanguinity in the spectrum of human disease. There are very few studies and research about the influence of consanguinity on craniofacial anomalies or cleft lip and palate.

REVIEW ARTICLE

In Southern India, consanguineous unions between biological kinds have a long tradition. ⁽⁶⁴⁾ The highest rates are reported in the states of Andhra Pradesh, Karnataka and Tamil Nadu, with Kerala being an exception because of the strict avoidance of consanguineous marriage. In the pursuit of genetic research into cleft lip and palate and craniofacial anomalies, it would seem appropriate that an investigation/ research study is carried out on the influence of consanguineous marriage on non-syndromic cleft lip and palate.

Indian Doctors, Government health authorities along with the NGOs have expressed a keen desire to be involved with research studies of OFC and contribute towards multidisciplinary treatment approach as recommended by WHO. These included the establishment of high volume treatment centers, modern equipments, availability of specialist doctors of all departments, inter departmental co-ordination and sharing of inter-center research projects in relation to registration of OFC cases, treatment and the outcome of the treatment. The large volume of cleft cases in India is partly contributed, by the unmitigated debt of past generations wherein a proportion of the adult population with unrepaired clefts who were not treated for primary surgery and other rehabilitation care. To date, however, there has been little attempt by various health agencies to register and evaluate treatment outcome, carry out inter-centre comparisons of treatment protocols and to implement multi disciplinary treatment outcome as recommended by WHO.

CONCLUSION: Congenital facial defects are a pressing problem in India owing to the limited resources to treat such patients. Setting up an institute to treat children with cleft and craniofacial deformities in India presents problems with financing treatment for poor patients, procuring the right infrastructure, and employing well-trained human resources.

The logistics of setting up such a facility in a developing country like India and the future of funding for cleft treatment are important factors to consider while establishing a centre and upgrading of established health centre for patients with cleft and craniofacial anomalies. The aim of setting up such centres should be to provide quality comprehensive & multidisciplinary treatment for patients belonging to sections of society with cleft and craniofacial anomalies.

In India large number of NGOs, government health agencies and health policies, and institutes are trying to address the problem of treatment and quality care of OFC cases. There is wide acceptance among various health agencies that an improvement in birth defects research, surveillance, and registration and quality treatment is required. Surveys and research on OFC by the various organization providing medical services for cleft lip and palate patients, availability of care, effects of previous surveys and importance of specific management techniques in bringing about improvement in the quality health care for OFC cases in our country is the need of time.

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CASE REPORT

ENDODONTIC MANAGEMENT OF AN UNUSUAL MANDIBULAR SECOND MOLAR BY USING SPIRAL COMPUTED TOMOGRAPHY: A CASE REPORT

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ABSTRACT: Aim of this case report is to present an endodontically managed unusual mandibular second molar .Summary: The present report describes endodontic management of a mandibular second molar having two roots which were fused and single canal (C-shape canal). In the present case ,we have used spiral computed tomography for better understanding of the complicated and unusual root canal morphology and successful management thereafter.

KEY WORDS- fused roots, Mandibular second molar, spiral computed tomography,

INTRODUCTION: The variations in root canal morphology, especially in multi-rooted teeth, are a constant challenge for diagnosis and successful endodontic therapy¹. Clinician is required to have an insight of the morphology of tooth related to its shape, form and structure before commencing treatment. Routine periapical radiographs helps us to assess the number, length, curvature and aberration of the canal system of the tooth². The drawback of radiographic techniques is, they only provide 2- dimensional image of a 3- dimensional structure. Multiple intraoral radiographs do not guarantee the identification of all relevant tooth anatomy. Computed tomography is an imaging technique having advantages of reduction in anatomical noise, high contrast resolution and the assessment of third dimension. CT imaging also helps determining the number of roots and root canals as well as where the root canals join or divide. CT scan has been proven superior over other diagnostic modalities in the detection of anatomic variations³. Generally, anatomical configuration of mandibular second molar consists of two roots (mesial and distal), which are seen closer together than the first mandibular molar. It can also be fused to a single conical root with varying internal anatomy and often have C- shaped canal configuration⁴.

This case report describes endodontic management of a mandibular second molar having two roots which were fused and single canal (C- shape canal) with the use of SCT as a diagnostic aid.

CASE REPORT

A CASE REPORT: A 40 year male patient referred from general dentist for the treatment of mandibular left second molar with Past history of endodontic treatment of the mandibular left first molar. Patient's complaint was pain in the mandibular left region, continuous since last week. There was no evidence of swelling or sinus tract. Clinical examination revealed a large mesiobuccal cusp and small distobuccal cusp with deep occlusal caries in relation to mandibular second molar(Fig. 1A). Intraoral periapical radiograph of tooth revealed deep caries approximating the pulp without any associated periapical changes. Vitality test for heat and cold were positive. Based on clinical and radiographic findings, a diagnosis of chronic irreversible pulpitis of the left mandibular second molar was made. Endodontic treatment was planned for the tooth. A detailed examination of the radiograph revealed the presence of a single root with three canals meeting at apical third(fig. 1B) but , the exact anatomy of the tooth could not be clearly identified. To ascertain this complex, root canal anatomy of the tooth in a three dimensional manner, dental imaging with the help of spiral CT was planned. Informed consent was obtained from the patient and SCT imaging of the mandible was performed by using the dental software Dentascan (GE Healthcare, Milwaukee, WI). The involved tooth was focused, and the morphology was obtained in transverse, axial and sagittal sections of 0.5mm thickness, along with 3-dimensional reconstructed images.The SCT images revealed that the mandibular second molar had two roots fused and single canal. After confirmation of the diagnosis, instrumentation of the involved tooth was planned. Local anesthesia was administered and a rubber dam was applied. Endodontic access cavity was done by using a no. 2 round bur and EX 24 bur(non end cutting tapered fissure; Mani, Tochigi, Japan). Pulp extirpation was performed by using a barbed broach (Dentsply Maillefer, Ballaigues, Switserzland) and K-files (Mani Inc, Togichi, Japan). The canal was thoroughly debrided with copious irrigation of sodium hypochlorite(2.5%), followed by saline(0.9%). On observation of the pulpal floor, only one canal with an oval orifice was located (on buccal aspect) suggestive of the presence of a single canal(Fig. 1C). Further exploration of the pulpal floor did not reveal presence of any additional orifice opening. The canal of this tooth was wide and tapering. The working length was determined by using apex locator (Propex; Dentsply Maillefer) and confirmed radiographically. Cleaning and shaping of the root canal system were completed by using a step-back technique (apical enlargement was done upto ISO no. 35). Copious irrigation was done to ensure complete removal of debris. Canal was dried with sterile paper points, calcium hydroxide (Ultracal XS; Ultradent, South Jordan, UT) was placed in the root canal and access cavity was temporized with Cavit G (3M ESPE, Seefeld, Germany). Patient was recalled after 1 week for obturation. After a week, tooth was asymptomatic, a gutta-percha cone fit radiograph was made(Fig. 1D) and the root canal was obturated by using thermoplastic obturation technique (E & Q PLUS; Meta Biomed Co Ltd, Cheongju, Korea) and AH PLUS as a sealer(Fig. 1E). The access cavity was then sealed with resin composite(Fig. 1F). The patient experienced no post-treatment consequences.

DISCUSSION: Knowledge of dental anatomy is an essential tool for the success of endodontic treatment. The dentist needs to be familiar with the various root canal configurations and their variations for successful endodontic therapy.

Vertucci proposed a standardized method for categorizing known root canal anatomic variations⁵. However, there are many individual tooth variations and hence each

CASE REPORT

case should be evaluated separately. Anatomy in the third dimension cannot be assessed on radiographs. Because root canals tend to lie one behind the other in buccolingual plane, they get superimposed onto each other on periapical, panoramic radiographs and easily go undetected⁶.

A new CT technique, SCT or volume acquisition CT, has been developed that has an inherent advantage. Current CT scanners have a linear array of multiple detectors, allowing multiple slices to be taken simultaneously, resulting in faster scan times and often less radiation exposure to the patient. The slices of data are then stacked up and can be reformatted to obtain 3-D images⁷.

CT is reformatting software used along with spiral/helical CT and allows assessment in all the three dimensions. Hence, we undertook this imaging modality to study the variation in anatomy of the mandibular molars and its role in endodontic treatment.

C-shaped canal system is commonly found in mandibular molars. Using spiral computed tomographic imaging, the prevalence of C-shaped canals in single rooted second molars was 8%. Vertucci type I canals were most frequently seen in these C-shaped molars 10%⁸. Anatomical variation such as fusion, germination, or anomalies in the roots may often be diagnosed based on preoperative radiographs. Radiographically, a tooth with a C-shaped canal system may always have a fused root with a longitudinal groove in the middle of the root⁹.

Based on the various studies, describing the canal anatomy for second mandibular molar, it is difficult to determine to which classification above described canal belong or it can just be described as Vertucci's type I canal system.

CONCLUSION: Knowledge and recognition of canal configuration can facilitate more effective canal identification and unnecessary removal of healthy tooth structure in an attempt to search for missing canals. With the advent of newer tomographic scanners like cone beam computed tomography (CBCT) or digital volume tomography specifically for maxillofacial and dental use, conventional scanners like SCT will be less preferred for dental imaging purposes. Nevertheless, the value of SCT as a diagnostic tool to a great effect in understanding the complex root canal anatomy, thus helping a great deal in rendering successful endodontic therapy. This case report highlights the role of SCT as an important diagnostic tool in endodontics, thereby enhancing overall success of endodontic therapy.

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Fig. 1A Preoperative photograph occlusal view



Fig. 1B preoperative radiograph revealing irregular morphology of tooth #37

CASE REPORT



Fig. 1C Photograph showing access opening Fig. 1D Mastercone IOPA



Fig. 1D Mastercone IOPA

CASE REPORT



Fig. 1E Postobturation radiograph



Fig. 1F Photograph after postendodontic composite resin restoration

REVIEW ARTICLE

PRECISION ATTACHMENTS; APPLICATIONS AND LIMITATIONS

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ABSTRACT: A unique concern of a removable denture when compared to others is retention. Retention is the ability of the prosthesis to resist the movement of denture away from the supporting tissues/teeth. The component of removable denture which provides retention is called as direct retainer.^{1,3,4}

A direct retainer can be either an extracoronal or intracoronal retainer. Extracoronal direct retainer uses mechanical resistance to displacement through components placed on external surface of abutment teeth. Intracoronal retainer is either cast or attached totally within the restored natural contours of an abutment tooth.¹

One of the main drawbacks of extracoronal retainers used in partial dentures is visibility. Many patients find themselves in an aesthetically compromised state when these retainers are placed on teeth in visible area. Precision attachments provide solution for this problem. Also, precision attachments provide better vertical support and better stimulation to the underlying tissue through intermittent vertical massage.^{1,9}

Although the history of intracoronal retainers goes back to 5th and 4th centuries BC, technically more sound developments began in early 20th century AD, with Dr. Herman E. S. Chayes formulating the principle of internal attachment in 1906. Since then precision attachments are playing an important role in removable and fixed partial denture, conventional and implant supported overdenture.⁹

KEY WORDS: Precision attachment, internal attachment, parallel attachment, frictional attachment.

INTRODUCTION: Precision attachment can be described as a retainer used in fixed and removable partial denture construction consisting of a metal receptacle and a closely fitting part, the former is usually contained within the normal or expanded contours of the crown of the abutment tooth, and the latter is attached to a pontic or to the denture frame work.¹

SYNONYMS: Internal attachment, parallel attachment, frictional attachment, key and key way attachment, slotted attachment.

INDICATIONS AND CONTRA INDICATIONS¹⁻¹¹

INDICATIONS:

REVIEW ARTICLE

Movable joints in fixed movable bridge work.
As stress breaker in free end saddles and bridges.
Intracoronar attachments as effective direct retainers for removable partial dentures.
As a connector for sectional dentures.
Sections of a fixed prosthesis may be connected with intra coronal attachments.
To lock a connector joining saddles in the opposite side of the arch.
As contingency devices for the extension or conversion of existing dentures.
Where fixed dentures are contraindicated due to periodontal condition.
In the esthetic zone where extracoronar direct retainer adversely affects the esthetics.
To retain hybrid dentures.

CONTRAINDICATIONS:

1. In patients who are sick and the senile (prosthesis with attachments must be inserted along one precise path of insertion, the patient must possess an average degree of manual skill).
2. Patients with severe Periodontitis.
3. Patients with abnormally high caries rate.
4. Where there is inadequate space (Teeth that are very narrow facio-lingually).

ADVANTAGES AND DISADVANTAGES¹⁻¹¹

ADVANTAGES:

1. The labial or buccal clasp arms can be eliminated altogether. This makes spectacular improvement in the esthetic excellence of a denture especially in the maxillary arch.
2. Precision attachments are less stressful to the abutment teeth than conventional clasps.

DISADVANTAGES:

1. The tooth may have to be extensively prepared to provide required space to accommodate intracoronar attachment.
2. The attachment is subject to wear as a result of friction between metal parts. As wear occurs, male portion fits more loosely thus permitting excessive movement and threat of injury to abutment teeth.
3. The extra coronal type of retainer extends out from the tooth near the gingival border, so there may be gingival irritation followed by usual inflammatory sequel.
4. The extracoronar type of attachment must occupy the space immediately adjacent to abutment tooth, which is precisely where a replacement tooth should ideally be positioned.

SEMPRECISION⁹ While prefabricated attachments are called as precision attachments, those fabricated in laboratory are called as semiprecision attachments. Precision attachment is made of precious metal and fit of two working elements is machined to very close tolerances, hence is more precise than laboratory fabricated attachment. Semiprecision attachments are usually

REVIEW ARTICLE

fabricated in base metal alloys. The semiprecision attachment is also called as precision rest, milled rest or the internal rest.

CLASSIFICATIONS^{2,3,9,10,13-15}

A simple classification based on location and attachment shape is presented here.

INTRACORONAL ATTACHMENTS:

The two parts of an intracoronar attachment consist of a flange and a slot. The flange is joined to one section of the prosthesis and the slot unit embedded in a restoration forming part of another section of the prosthesis.

Two types of intracoronar attachments are available

- a. Those whose retention is entirely frictional**
E.g. McCollum intra coronal unit.
- b. Those whose retention is augmented by a mechanical lock.**
E.g. Schatzmann unit
Additional retention is provided by a spring loaded plunger.

Depending on the cross sections intra coronal attachments can be classified into (Fig- 1)

- 1. H-Shaped flanges** The external frictional flange of H-Shaped unit strengthens the attachment, without increasing the size of the female part.
- 2. T-shaped flanges**
E.g. Chayes attachment.
- 3. Attachments with a circular cross section.** They are suitable only for joining two sections of a fixed prosthesis.

The friction fit intracoronar attachments with adjustment potential are:

- a. Chayes
- b. Crismani attachments
- c. McCollum unit
- d. Ancra attachment.
- e. T-Geschiebe 123

ATTACHMENTS WITH AUXILIARY RETENTIVE FEATURES:

Auxiliary retentive features are incorporated in some attachments in an effort to provide more retention for a given frictional area although no extra stability is provided. A minimum of 4 mm vertical space is necessary.

E.g.: Crismani units, Stern gingival latch attachment and Micro.

Before choosing an attachment with auxiliary retentive devices the following factors should be considered.

- a. Bulk
- b. Adjustment
- c. Retention mechanism
- d. Trimming the attachment

REVIEW ARTICLE

- e. Plaque control

THE FRICTION FIT INTRACORONAL ATTACHMENTS WITHOUT ADJUSTMENT POTENTIAL:

Lack of adjustment potential renders this type of unit unsuitable for removable prosthesis, as repeated insertion and removal will cause the attachment to wear. They are useful for joining a series of crowns without a common path of insertion. Round profiles are useful when anterior teeth are concerned.

E.g.: Beyler.

Applications of intracoronal attachments

1. **Retainers:** Intra coronal attachments are effective and almost invisible retainer for bilateral and unilateral prostheses.
2. **Connectors:** Sections of a fixed prosthesis may be joined with intracoronal attachments. This possibility can be useful where;
 - a. Prostheses do not share a common path of insertion yet can be connected rigidly in the mouth.
 - b. The operator prefers to limit the length of individual castings while making a large span fixed prosthesis.
 - c. The prognosis of a distal abutment is dubious.
Connecting the posterior segment with an attachment allows subsequent removal without damage to the main restoration. The attachment slot can be used for later construction of an attachment retained denture

EXTRACORONAL ATTACHMENTS:

These attachments have part or all of their mechanism outside the crown of a tooth. Many of these units allow a certain amount of movement between the two sections of the prosthesis. Their main application is for distal extension prosthesis. They may be used to retain restorations for bounded spaces. Extracoronal attachments can be subdivided into following groups.

a. Projection units

The units are attached to the proximal surface of a crown. These groups can be divided in turn into;

1. Those that provide a rigid connection. Eg. Conex attachment
2. Those that allow play between the components. Eg. Dalbo extracoronal projection unit, Ceka system with retaining ring.

b. Connectors

These units connect two sections of a removable prosthesis and allow a certain degree of play. Two basic types of joints are manufactured

1. **The axial rotation joint:** It provides restricted vertical travel together with predetermined hinge movement. A small window is cut out of the female section around the screw. The male section is therefore free to travel up and down within the narrow confine of the window. Rotation and lateral movements can be provided by dismantling

REVIEW ARTICLE

the attachment and very slightly trimming the male unit. This joint can be incorporated within the Scott attachment.

- 2. The rotation joint:** Here there is no window around the screw and therefore vertical movements cannot take place. The rotation joint was designed for unilateral distal extension prosthesis as this type of denture is usually tooth and mucosal supported on one side and entirely tooth supported on the opposite side. Since vertical movement could be damaging to the teeth on the tooth supported side, Steiger designed the rotation joint to allow only slight rotational and lateral movements in order to minimize torque transmitted from the distal extension prosthesis. The design would therefore incorporate an axial rotation joint connecting the distal extension base to the retainer and major connector, while the retainer on the opposite, tooth supported, side would be connected through a rotation joint. The Steiger joints are models of careful designs and are one of the few attachments in which the amount and direction of the movement allowance can be precisely determined by the operator. If appreciable wear takes place, both parts of the attachment can be removed from the mouth and a replacement soldered on.

STUD ATTACHMENT (Figure 2):

These attachments are so called because of the shape of the male units that are usually soldered to the diaphragm of a post crown. The female part fits over the male unit and is embedded within the acrylic resin of the prosthesis or soldered to a metal substructure. There are a few systems in which the male section forms parts of the denture and the female part of the root surface preparation. Few stud attachments are entirely rigid, since their size makes it difficult to prevent a small amount of movement between the two components. In some attachments springs or other devices are specifically incorporated to allow a controlled degree of movement. Dalbo, Conod's unit, Rothermann unit, Baer and Fah units are few examples of stud attachments.

Stud attachments have numerous applications:

- 1. Overdenture** being relatively small they can provide additional stability, retention and support while the positive lock of certain units can maintain the border seal of the denture.
- 2. Non-vital partial denture abutments.** The loads applied in these circumstances can be considerable, so one of the larger and stronger units is recommended.
- 3.** For retention of a small tooth supported restoration with non-vital abutment.

BAR ATTACHMENTS (Figure 3)

Bar attachments consist of a bar spanning an edentulous area joining together teeth or roots. The denture fits over the bar and is connected to it with one or more sleeves. Bar attachments are of 2 categories.

- a. Bar joints** These units allow play between denture and bar. The bar is usually attached to diaphragms on root filled teeth, locking the roots together and improving the crown / root ratio. A common path of insertion for the retaining posts is desirable although divergence can be overcome by mechanical means. Alternatively the abutment teeth can be crowned and these crowns connected by the bar.

REVIEW ARTICLE

Bar joints can be subdivided into:

1. Single sleeve bar joints

The Dolder bar joint is an excellent example of this attachment. This well tried bar is produced from wrought wire, pear shaped in cross section and running just in contact with the oral mucosa between the abutments. An open sided sleeve is built into the impression surface of the denture and engages the bar when the denture is inserted.

2. Multiple sleeve joints

If several short sleeves are substituted for the continuous one, there is no need for the bar to run straight and it can be bent to follow the vertical contours as well as the antero-posterior curvature of the ridge.

Gilmore, Ackerman, Hader are few commonly used bar joints. Multiple sleeve bar joints are more versatile than the single sleeve units, but the bars seem to have slightly less rigidity.

b. Bar units

Bar units are comparatively rigid allowing no movement between the sleeve and bar. Although some load may be distributed to the mucosa these prostheses are mainly tooth borne. Bar units may be useful where;

1. There are 4 or more abutment teeth and large edentulous spaces.
2. The number and distribution of the teeth does not allow construction of a satisfactory clasp retained partial denture.
3. There are edentulous areas with considerable resorption.
4. Rigid splinting is required for remaining teeth or roots.

Bar units provide excellent retention and stability for a denture while rigidly splinting the abutments. Artificial mucosa can be provided by the denture flange and the removable section can be rebased or repaired like clasp retained prosthesis.

Drawbacks are that the bar provides a medium for accumulation of plaque and the patient must maintain a good standard of hygiene. Other contra indications are patients with poor manual skills and those with limited vertical or bucco lingual space.

The Dolder bar unit is a well established and reliable unit. The bar has parallel sides unlike the pear shaped profile of the bar joint. Retention for the sleeve is entirely frictional, provided by the parallel vertical surfaces of both sections.

M.P. CHANNEL SYSTEM: These MP channels are extremely slim and save the operator and technician the problems and expense of milling. Additional retention between the two sections of the unit can be provided by incorporating a plunger in the sleeve. Guiding flanges should be incorporated to prevent rotation around the plunger and to obtain maximum retention.

MECHANISM OF ACTION: Retainers must hold the prosthesis securely in place during chewing, swallowing, speaking and other oral functions. Therefore, male and female portions must fit together precisely.

Resistance to separation within the attachment is by following mechanisms.

REVIEW ARTICLE

- i) Friction
- ii) Binding
- iii) Wedging of conical bodies
- iv) Internal spring loading
- v) Active Retention

ATTACHMENT SELECTION: In 1971, 126 attachments were listed and classified by **Dr. Merrill Mensor**; this is called as **E. M. attachment selector**.¹⁵

It has 5 charts giving specification as to type, vertical dimension (Minimal and Maximal), whether it is for anterior and posterior teeth, whether the assembly is simple or complex, whether the function is rigid or resilient, type of resilience, size of movement and type of retention. It shows if the attachment is interchangeable or replaceable and finally what type of alloy and material it is made of.

E.M. attachment selector system utilizes a colour coded millimeter attachment gauge to define the vertical clearance available in the edentulous regions of occluded casts for attachment selection. The gauge is made of plastic and measuring 75 mm in length. It is graduated from 3 to 8 mm in 1 mm increments with a corresponding colour code. Red designates 3 to 4 mm, yellow designates 5 to 6 mm and black designates 7 to 8 mm. The gauge is placed between the occluded casts adjacent to a tooth that will carry an attachment. The measurement is thus read numerically and according to colour. The vertical limits measured by the EM gauge are the common area of concern for all connector systems. The available space will govern the type of attachment system that can be used. A closed vertical space will narrow the selection of available or recommended attachments. Where vertical intermaxillary space is abundant, the choice of attachment systems is less restricting.

In selecting an attachment system;

- i) The first decision that must be made is whether to use an intracoronal or extracoronal attachment
- ii) The second decision to be made is whether to use a resilient or a nonresilient type
- iii) The third consideration is that the largest attachment can be used within the given space should be chosen to gain maximum stability, retention and strength for the prosthesis.

CONCLUSION: The success of prosthesis depends on careful treatment planning and attention to the prosthodontic problems; the mechanical ingenuity of the attachment is important, but must take second place. Precision attachments present a challenge in the technical skill. A thorough understanding of the biomechanics of maxillomandibular function, different attachments and knowledge of material science is essential in treating a case of precision attachment. Unfortunately, most often precision attachments are chosen from descriptions in manufacturer's catalogues which leads to failure of precision attachment cases. Precision attachments serve the function of retention, stress distribution and aesthetics successfully provided the case is planned based on sound biological and technical grounds and proper care is rendered by the dentist and the patient during the maintenance phase.

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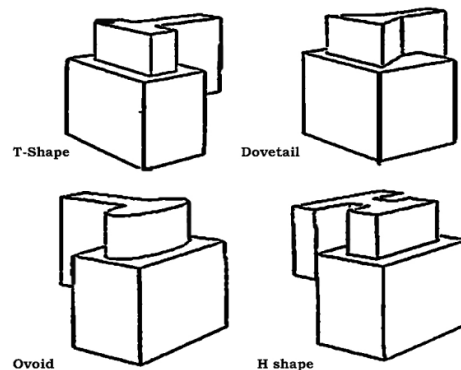


Figure 1 Cross sections of attachments

Stud attachment (Dalbo)

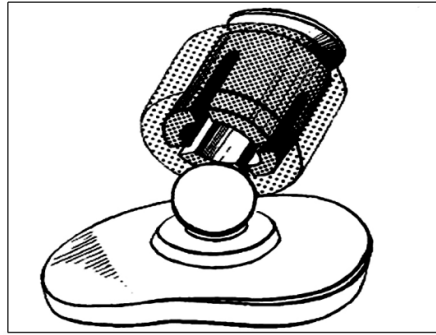


Figure. 2 Stud attachment

Bar attachment (Dolder)

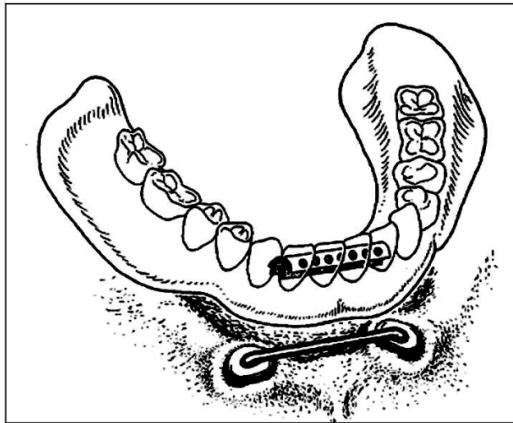


Figure 3 Bar attachment

MUCOCELES OF THE APPENDIX- A RETROSPECTIVE STUDY FROM A TERTIARY HEALTH CARE CENTRE.

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ABSTRACT: The mucocele of the Appendix is an uncommon cystic lesion characterised by distension of the appendiceal lumen with mucus. The incidence ranges from 0.3% to 0.7% of all appendectomied specimens. **OBJECTIVE:** We report here the demographic, clinical, radiologic, histopathologic, preoperative and postoperative findings and outcome of patients of mucocele of the appendix diagnosed on histopathologic examination. **METHODS:** We retrospectively analysed the hospital records of all the patients whose appendectomy was done and had a histopathological diagnosis of mucocele of the appendix. **RESULTS:** A total of 885 patients with the preoperative diagnosis of appendicitis were admitted and surgically treated in our centre from April'2004 to September'2012 and 13 (1.47%) patients were diagnosed to have mucocele of the appendix on histopathologic examination. Average age of presentation was 53yrs (range 17yrs - 85yrs). 6(46.15%) patients were male and 7 (53.85%) were female with M: F ratio 0.86:1. The most common presentation was right lower quadrant pain in 7 (53.85%) patients. 2(15.38) patients presented with generalised abdominal pain, distension of abdomen and loss of appetite while 4(30.77%) patients were asymptomatic. In preoperative ultrasonographic examination, appendiceal cystic masses were diagnosed in 7 (53.85%) patients. Histopathologic examination revealed simple mucocele in 7 (53.85%) patients, mucinous cystadenoma in 5 (38.46%) and mucinous cystadenocarcinoma in 1(7.69%) patient. Two patients of mucinous cystadenoma were diagnosed with complication of pseudomyxoma peritonei. No mortality was noted in any of the patient postoperatively and on follow up. **CONCLUSION:** Mucocele of the appendix is a rare disease and is usually diagnosed on histopathologic examination of Appendectomied specimens. As there is potential for malignant transformation and pseudomyxoma peritonei due to rupture of the mucocele, extensive preoperative evaluation and thorough intraoperative gastrointestinal, ovarian & peritoneal examination is required.

KEY WORDS: Appendix, mucocele, mucinous cystadenoma, mucinous cystadenocarcinoma, pseudomyxoma peritonei

MESH : Appendix, cystadenoma, mucocele, male, female, pseudomyxoma peritonei.

ORIGINAL ARTICLE

INTRODUCTION: Appendiceal mucocele, first described by Rokitansky (1); refers to localised or diffuse dilatation of appendiceal lumen by an abnormal accumulation of mucus. It represent 0.3%-0.7% of appendiceal pathology and 8% of appendiceal tumors (2). Its frequency is higher in females (M: F = 1: 4) and in people older than 50 yrs of age (3). Mucocele of appendix are difficult to diagnose despite extensive preoperative evaluation. Patients are often asymptomatic and lesions are usually discovered incidentally intraoperatively or postoperatively during histopathological examination (3). Others may present as acute appendicitis or as acute or chronic non specific abdominal pain with or without vomiting.

Mucoceles of appendix can be divided into three categories (4):

1. Simple or Retention mucocele resulting from obstruction of appendiceal outflow and characterised by normal or hyperplastic epithelium with mild luminal dilatation upto 1.0 cm. These constitute 5 – 25% of mucoceles.
2. Mucinous cystadenoma – Most common form accounting for 63- 84% cases of mucoceles. These exhibit epithelial villous adenomatous changes with some degree of epithelial atypia and characterized by marked distension of lumen (upto 6.0 cm.). The neoplastic epithelium is similar to that seen in villous adenomas and adenomatous polyps.
3. Mucinous cystadenocarcinoma – representing 11-20% of cases. These show glandular stromal invasion and / or presence of epithelial cells in peritoneal implants. The neoplastic epithelium is similar to that seen in adenocarcinoma of colon.

Mucinous cystadenoma and mucinous cystadenocarcinoma may rupture producing fatal entity pseudomyxoma peritonei.

METHOD: This was a unicentric retrospective study, patients with the diagnosis of Appendiceal mucocele were searched from the hospital records. These patients were evaluated for age, sex, symptom duration, major complaint, ultrasonographic and computed tomographic findings, surgical procedures performed, histopathologic diagnosis, complications if any and their follow up outcomes.

INCLUSION CRITERIA: All cases diagnosed as Appendiceal mucocele on Histological examination were included.

EXCLUSION CRITERIA: Cases suspected as Appendiceal mucocele on ultrasonography or/ and computed tomography but not proved on histological examination were excluded.

RESULTS: A total of 885 patients with the preoperative diagnosis of appendicitis were admitted and surgically treated in our centre from April' 2004 to September'2012. Out of them 13 (1.47%) patients were diagnosed to have mucocele of the appendix on histopathologic examination. Average age of the patients in years was 53 yrs (range 17yrs – 85yrs). 6 (46.15%) patients were male and 7 (53.85%) were female with M : F ratio 0.86: 1. The duration of the symptoms was between 1 day to 2 months, with a median of 6 days. Right lower quadrant abdominal pain was the most common complaint in 7(53.85%) patients while 2 (15.38%) patients were admitted with complaints of generalised abdominal pain and loss of appetite. These 2 patients were females and had distension of abdomen with mild to moderate ascitis. Appendiceal mucocele was detected incidentally in 4(30.77%) patients. Laboratory

investigations showed leucocytosis in 8 (61.54%) patients with increased absolute neutrophil count. All other routine biochemical and haematological parameters were within normal limits. Preoperative ultrasonographic examination of the patients revealed appendiceal cystic mass (mucocele) with variable internal echogenicity in 7 (53.85%) patients, while free fluid was found in abdomen in 2 of these 7 patients. Abdominal CT examination was done in 4 (30.77%) patients ; 2 patients were reported as having appendiceal cystic tumoral mass containing mural calcification. Peritoneal fluid was tapped from 2 patients who had ascitis, and was reported as pseudomyxoma peritonei / mucinous tumor in view of presence of clusters of epithelial cells and stromal fragments in mucinous background.

Appendiceal cystic mass was appreciated by the surgeons in 10 (76.92%) patients during intraoperative exploration, out of which 2 patients who had ascitis were found to have dense mucinous deposits on appendix, omentum, uterine, ovarian and peritoneal surfaces. Appendix was ruptured in both of these cases. 11 (84.62%) patients were treated by appendectomy. In 2 patients who had ruptured mucocele with diffuse pseudomyxoma peritonei, caecectomy with omenectomy was performed. As both these patients were postmenopausal females and dense mucinous deposits were present on uterine and ovarian surface, total abdominal hysterectomy with bilateral salpingo-oophorectomy was also done. Both these patients were given early postoperative chemotherapy.

Histopathologic examination revealed simple mucocele in 7 (53.85%) patients, mucinous cystadenoma in 5 (38.46 %) patients, mucinous cystadenocarcinoma in 1 (7.69%) patient. In the 7 patients with preoperative ultrasonographic diagnosis of appendiceal cystic masses (mucocele), histopathologic examination showed simple mucocele in 3 patients and mucinous cystadenoma in 4 patients. In 1 patient diagnosed as mucinous cystadenocarcinoma, right colectomy was done subsequently. No peritoneal or adjacent organ involvement was seen in this patient and no lymph node metastasis was seen.

In both the patients with pseudomyxoma peritonei, ruptured primary mucinous cystadenoma of appendix was diagnosed on histopathology examination. Pools of mucin were also seen on the surface of both ovaries, uterus, peritoneum and omentum with very few benign looking epithelial cells. Ovarian tumor was ruled out in both these patients.

No postoperative morbidity or mortality occurred. Average postoperative length of hospital stay was 4.6 (2 - 10) days. At postoperative follow up of two patients of pseudomyxoma peritonei and one patient of mucinous cystadenocarcinoma ; physical examination, abdominal sonography, carcino-embryonic antigen (CEA) and other laboratory investigations were done twice a year. No tumor was detected in any of the cases on follow up for two years. Long term follow up is required to access the final outcome.

DISCUSSION: Present study showed much higher incidence of appendiceal mucocele (1.47%) in appendectomied specimens as compared to 0.3 - 0.6% reported in previous studies (2, 5). However increased incidence (2.01%) of appendiceal mucocele from some tertiary health care centres have also been reported (6). Female preponderance was seen in our study with M : F ratio 0.86 : 1, which is much lower as compared to reported in some previous studies(3,5). However some recent reports show a male predominance (2:1), suggesting that the gender distribution of appendiceal mucoceles is changing (7). Average age of presentation was 53 years which was in concordance to that reported previously (3,5) that is more than 50yrs of age.

In our study 7 (53.85%) patients presented with right lower quadrant abdominal pain while 2 (15.38%) with generalised abdominal pain, abdominal distension & loss of appetite. In

remaining 4 (30.77%) patients, Appendiceal mucocele was an incidental finding. In a study done by Muthukumaran Rangarajan et al (7), out of 9 patients, 6 (66.67 %) presented with pain localised to right lower quadrant of abdomen while 2 (22.22 %) with palpable mass. S. Yakan et al (5) reported right lower quadrant abdominal pain in 8 (89%) and generalised abdominal pain in 1(11%) out of 9 patients.

Our study revealed leucocytosis in 8 (61.54%) out of 13 patients. In a similar study by S. Yakan et al (5), leucocytosis was seen in 5 (55.56%) out of 9 patients. In our study preoperative ultrasonographic examination showed appendiceal cystic mass (mucocele) in 7 (53.85%) patients, while free fluid was found in abdomen in 2(15.38%) patients. Abdominal CT examination was done in 4 (30.77%) patients; 2 (15.38%) patients were reported as having appendiceal cystic tumoral mass containing mural calcification. Kemal Karakaya et al (8) reported in their study that USG and CT examination showed appendiceal cystic mass with peripheral enhancement in 3 (60%) out of 5 patients, free fluid in 1(20%) patient and in one patient CT / USG was not done. In the study of Muthukumaran Rangarajan et al (7), USG was able to diagnose cystic appendiceal mass in 6 (66.67 %) patients and CT revealed mucocele in 2(22.22%) out of 9 cases. While in the study of S. Yakan et al (5), appendiceal cystic mass was diagnosed in 4 (44.5%) patients on USG and in 1 (11%) patient on CT examination.

Simple appendectomy was done in 10(76.92%) patients in present study, in 2(15.38 %) patients caecectomy and in 1 (7.69%) patient hemicolecotomy was done. In the study of S.Yakan et al (5), appendectomy was done in 6 (67%) and right hemicolecotomy in 2(22%) patients. Kemal Karakaya et al (8) have reported simple appendectomy in 3(60 %) and caecectomy in 2 (40%) patients. Present study revealed higher incidence of simple retention mucocele as compared with previous studies. Histopathologic examination showed simple mucocele in 7(53.85%), mucinous cystadenoma in 5 (38.46 %) patients and mucinous cystadenocarcinoma in 1 (7.69%) patient. S Yakan et al(5) have reported simple mucocele in 2(22%), mucinous cystadenoma in 4(45%) and mucinous cystadenocarcinoma in 3(33%) cases. Kemal karakaya et al(8) have reported four cases of mucinous cystadenoma and one case of simple mucocele.

Different theories had been postulated in literature about mucocele origin. The first, postulated by Neeslund (9), is mechanical and starts from an obstacle (diverticulitis, inflammation, polyps) at the base of appendix, which gives an accumulation of mucus inside the appendix, increasing volume and consequently causing rupture. Another theory is nervous; hyperincretion of mucus and muscular paralysis could cause the chngement of appendix in a cyst (9). According to Higa classification we know retention cysts, caused by mucin accumulation and dilations due to hyperproduction of mucus by an appendicular benign or malignant neoplasia (10). In this last condition it is important to specify the nature of the malignancy because gelatinous mass cells have an autonomic growth maintaining function of mucus secretion (11).

USG, CT and colonoscopic examinations can facilitate preoperative diagnosis of appendiceal mucocele (12 -15). Ultrasound is the first line diagnostic modality for patients with acute abdominal pain or mass. Different sonographic findings of appendiceal mucocele and acute appendicitis have been described (16-18). Outer diameter of appendix 15mm or more in USG examination has been described as the threshold for the diagnosis of appendiceal mucocele with a sensitivity of 83% and a specificity of 92% (16), while for acute appendicitis it has been established as 6mm (19). USG examination revealed appendiceal cystic mass in 7 of our patients. CT is the modality of the choice in cases of appendiceal mucocele because of its ability to detect the anatomic location of mass and tissue characteristics. Mural curvilinear calcification

aids considerably in the diagnosis but occurs in less than 50% cases (20). USG and CT findings are not specific and the differential diagnosis should be established with other pathologies such as carcinoid, lymphoma, mesenteric cysts and ovarian masses (2, 21). Fine needle aspiration of the appendiceal mucocele is generally avoided because of fear that puncture of a distended viscus will lead to localized or diffuse pseudomyxoma peritonei (17). Colonoscopy in patients with abdominal pain is a useful tool for determination of mucocele (22, 23). Generally an elevation of the orifice of the appendix is seen. A yellowish mucous discharge would be visible from appendiceal orifice during colonoscopy. 'Volcano sign' is appendiceal orifice in the centre of a firm mound covered by normal mucosa or lipoma like submucosal mass. Colonoscopy is also important for the diagnosis of synchronous and metachronous colon tumor. Elevated CEA levels have been described in neoplastic mucoceles (24)

The spontaneous and surgery induced complications of appendiceal mucocele include intestinal obstruction, intussusceptions (21), intestinal bleeding (13,25), fistula formation (15) and volvulus (26). The worst complication is pseudomyxoma peritonei. The preoperative diagnosis that distinguishes appendiceal mucocele from acute appendicitis is essential for the best choice of surgical approach (open Vs laproscopic) to prevent peritoneal dissemination of mucin producing epithelial cells and perform the appropriate surgery (16, 27). It was thought that only mucinous cystadenocarcinomas lead to pseudomyxoma peritonei (3). However other authors believe pseudomyxoma peritonei can complicate either benign or malignant mucoceles, although pseudomyxoma peritonei from the former would carry a better prognosis (10, 28, 29). No reports of lymphatic or hematogenous spread of mucinous cystadenocarcinoma are found in the literature.

Most acknowledge that pseudomyxoma peritonei predominantly originates in the appendix in men and increasingly evidence suggests a similar site of origin in females (30, 31). In women synchronous ovarian and appendiceal disease is common, and Pseudomyxoma peritonei appears more prevalent. However immunohistochemistry and molecular genetic techniques support the hypothesis that in the majority of women, the ovarian tumor is metastatic from a perforated appendiceal mucinous tumor (32 - 35).

Concomitant cases of appendiceal mucocele and colon adenocarcinoma have been described with an incidence of 19.5% - 21.4% (10, 28, 36). In our study no such concomitance was noted. The progression of mucinous cystadenoma to mucinous cystadenocarcinoma has not been proved yet, but it is suggested.

Dhage- Ivatury and Sugarbaker (37) have suggested simple appendectomy as the choice of treatment for patients with benign mucocele that has negative margins of resection and without perforation. No long term follow up is needed for these patients. In patients having perforated mucocele with positive margins of resection and negative appendiceal lymph nodes, caeectomy / cytoreductive surgery (CRS) / Heated intraperitoneal chemotherapy (HIIC) and early postoperative intraperitoneal chemotherapy (EPIC) should be performed. Long term follow - up is also obligatory. In patients having perforated mucocele with positive margins of resection and positive appendiceal lymph nodes, right hemicolectomy / CRS / HIIC and EPIC should be performed. Long term follow-up is also obligatory in these patients.

The 5- year survival rate for simple or benign neoplastic mucocele after appendectomy ranges from 91% to 100% , but recurrences as pseudomyxoma peritonei and metachronic colonic neoplasms causing mortality can be seen (3, 38, 39). Cystadenocarcinoma without peritoneal or adjacent organ involvement also show good outcome after surgical resection, but

ORIGINAL ARTICLE

if it progresses to pseudomyxoma peritonei, 5 yr survival is 25%, with most deaths attributed to intestinal obstruction and renal failure (40).

CONCLUSION: Appendiceal mucocele is a relatively uncommon pathology seen in people older than 50 yrs of age with female preponderance. Surgical treatment of appendiceal mucocele is mandatory because of the potential for malignant transformation and pseudomyxoma peritonei due to rupture of the mucocele itself. Preoperative suspicion and diagnosis of appendiceal mucocele are important. Appendiceal mucocele should be considered in patients presenting as right lower quadrant abdominal pain or diffuse abdominal pain. Ultrasonography and computed tomography are useful tools for the diagnosis of appendiceal mucocele. Accurate preoperative diagnosis is a major component for optimal management, to minimize intraoperative and post operative complications. Extreme care must be taken while handling the tissue during operation. Intraoperative exploration of the entire gastrointestinal tract and ovaries in females should be done. All gross peritoneal implants should be removed and examined for presence of epithelial atypia for diagnostic and prognostic purposes.

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Fig 1 - Gross appearance of Mucocele of the Appendix, cystically dilated with abundant mucin and ruptured.

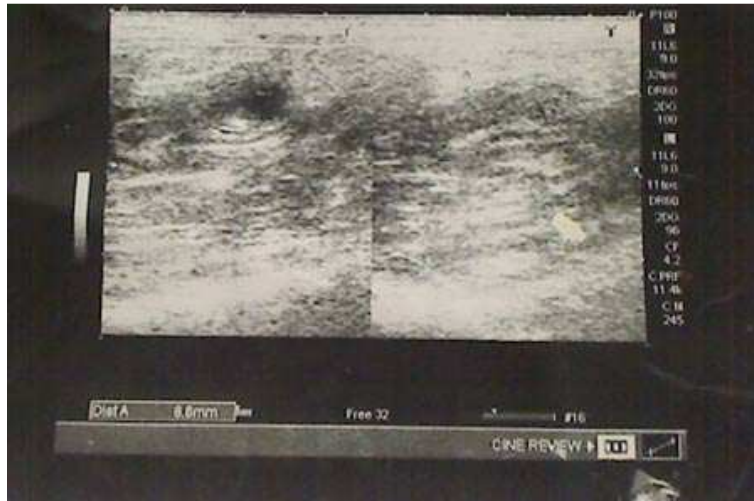


Fig 2 - High resolution Ultrasonography of right iliac fossa showing lobulated thick walled hypoechoic blind loop.



Fig 3 - Abdominal computed tomography, sagittal section - lobulated blind loop hypodense lesion showing wall calcification with localized fluid just below blind loop suggesting ruptured Mucocele of Appendix.

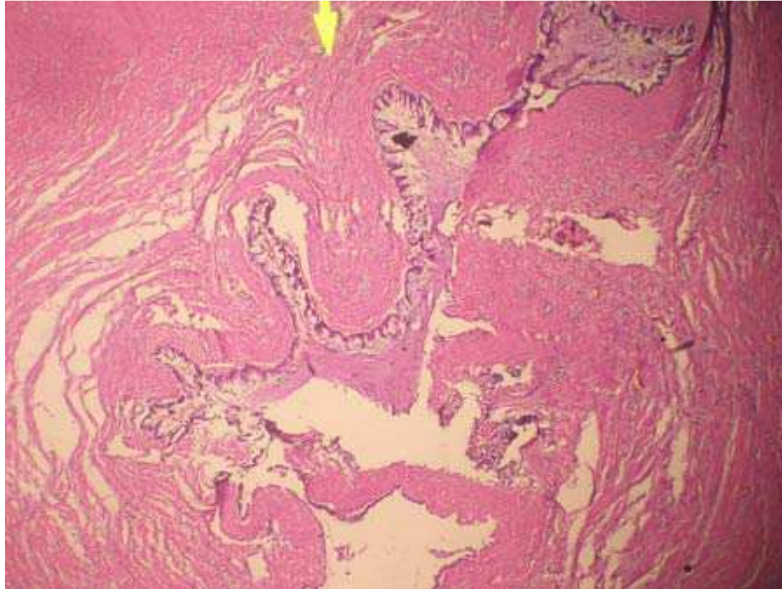


Fig 4 - Microphotograph showing Mucinous cystadenoma of the Appendix; wall is lined by mucin secreting epithelium with mucin in the lumen (H & E).

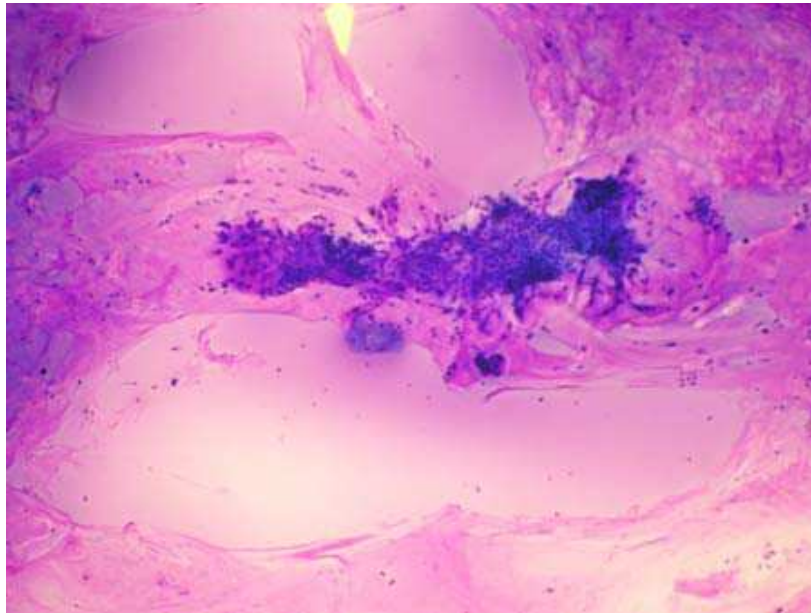


Fig 5 - Pseudomyxoma Peritonei - Ascitic fluid cytology showing mucinous material with groups of epithelial cells (Geimsa).

EVALUATION OF ANTIULCEROGENIC PROPERTY OF QUERCETIN IN ALBINO RATS

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ABSTRACT: OBJECTIVES: To study the possible antiulcerogenic property of quercetin, and to compare it with standard drug ranitidine. **METHODS:** The study was carried out in two ulcer models i.e alcohol model and indomethacin model. Both the models consist of 3 groups (control, standard control, test compound groups) of 6 rats each. The control group received only ulcerogen whereas the standard control group and test compound group were pretreated with ranitidine and quercetin respectively for 5 days before exposure to ulcerogen. On 5th day the rats were sacrificed, stomach dissected out and opened. Ulcer grading was done and ulcer index was calculated. Statistical analysis was done by using Student's t test. p value of < 0.05 was considered for statistical significance. **RESULTS:** In Alcohol model, the rats pretreated with quercetin showed highly significant protection ($p < 0.001$) when compared to control group and significant protection when compared to ranitidine pretreated group ($p < 0.05$). In indomethacin model, both quercetin and ranitidine pretreated groups showed significant protection when compared to control group ($p < 0.01$). **CONCLUSION:** Present study indicates that quercetin is highly effective in preventing ethanol-induced gastric mucosal damage (better than ranitidine) and equally effective as ranitidine in preventing indomethacin-induced gastric mucosal damage.

KEY WORDS: Quercetin, Ranitidine, Gastric ulcer, Ethanol, Indomethacin.

INTRODUCTION: Peptic ulcer is very common disease. It kills few but troubles many¹. Peptic ulcer results probably due to an imbalance between aggressive factors (acid, pepsin, H. pylori) and defensive factors (gastric mucus, prostaglandins and bicarbonate secretion).² Whatever may be the cause of peptic ulcer, it is the gastric acid that prevents ulcer healing and maintain the ulcer. Therefore most of the drugs available for treatment of peptic ulcer either neutralize the secreted acid or decrease the acid secretion.

There is growing body of experimental data that suggests the generation of oxygen derived free radicals and lipid peroxidation as one of the mechanisms in pathogenesis of peptic ulcer.³ Hence there is a need to develop drugs that are directed towards scavenging of these free radicals and produce antiulcerogenic effect.

Quercetin is a bioflavonoid found in many plants. It is widely distributed in edible fruits and vegetables⁴. It is weakly toxic drug and has been used in the treatment of allergy, bee sting and ulcer with no serious side effects in adults⁵. It is a very strong antioxidant, prevents oxidant injury and cell death by several mechanisms such as scavenging oxygen free radicals^{6,7}. Its

antioxidant potential is four times that of vitamin E⁸. It is potent inhibitor of lipid peroxidation^{9,10,11}. It is also a proton pump inhibitor¹⁰. Because of these properties of quercetin this scientific study is undertaken to evaluate its antiulcerogenic property in albino rats.

MATERIALS AND METHODS: Animals : 36 albino rats of Wistar strain of either sex weighing 150 - 200 g were selected from central animal house of Karnataka Institute of Medical sciences, Hubli. The animals were kept on standard diet and allowed food and water *ad libitum*. The experimental protocol was approved by the institutional animal ethical committee.

MATERIALS:

Drugs:

- Ethanol (99.9%) – As ulcerogenic agent.
- Indomethacin (Microlabs Ltd) – As ulcerogenic agent.
- Ranitidine (JB Chemicals & Pharmaceuticals Ltd) – As standard control.
- Quercetin (Sisco Research Laboratories) – As test compound.

Dose and duration and administration of drugs

- Ethanol (99.9%) – A dose of 1 ml.
- Indomethacin – 20 mg/kg, 2 doses at an interval of 15 hrs.
- Ranitidine – 25 mg/kg, once daily for 5 days.
- Quercetin – 50 mg/kg, once daily for 5 days¹².

(Quercetin powder freshly dissolved in distilled water during treatment)

All drugs are administered intragastrically through infant feeding tube.

METHODS:

1) Ethanol induced gastric ulcers

In this method, 18 albino rats were divided into 3 groups with 6 rats in each group.

Group I A (Control) : Received ulcerogen only.

Group I B (Standard control): Received ranitidine once daily for 4 days and 30 minutes prior to ulcerogen on 5th day

Group I C (Test compound) : Received quercetin once daily for 4 days and 30 minutes prior to ulcerogen on 5th day

The animals in all the groups were fasted for 24 hrs prior to the administration of ulcerogen with water *ad libitum*.

Animals were sacrificed 4 hrs after the administration of ethanol by dislocating cervico-atlanto joint. The anterior abdominal wall was opened and the stomach was dissected out.

2) Indomethacin induced gastric ulcers

In this method 18 albino rats were divided into 3 groups of 6 rats each.

Group II A (Control) : Received ulcerogen only.

Group II B (Standard control): Received Ranitidine once daily for 3 days and 30 minutes prior to ulcerogen on 4th & 5th day

Group II C (Test compound) : Received quercetin once daily for 3 days and 30 minutes prior to ulcerogen on 4th & 5th day.

ORIGINAL ARTICLE

The animals in all the groups were fasted for 24 hrs prior to the administration of ulcerogen with water ad libitum. Two doses of indomethacin were administered at an interval of 15 hrs.

Animals were sacrificed 6 hrs after the second dose of indomethacin by dislocating cervico-atlanto joint. The anterior abdominal wall was opened and the stomach was dissected out.

In both the methods, the dissected stomachs were opened along the greater curvature, the number of ulcers was noted and grading of ulcers was done according to the method described by Laurence and Bacharach¹³:

Grade	Type of gastric mucosa
0	Normal
1	Scattered hemorrhage spots
2	Hemorrhagic spots + ulcer
3	Deep hemorrhagic spots + ulcer
4	Perforation

The ulcer index was calculated for each group by the method of Sunita and Devdas¹⁴:

$$\text{Ulcer index} = \text{Arithmetic mean of the intensity in a group} + \left(\frac{\text{Ulcer positive No.} \times 2}{\text{Total No. of rats}} \right)$$

Statistical analysis: The results were interpreted by paired Student's t test. A p value of < 0.05 was considered as statistically significant.

RESULTS: Group I A: In this group, the total score, mean score, ulcer incidence and ulcer index were 16, 2.67, 100% and 4.6 respectively. (Table 1)

Group I B: In this group there was reduction in total score, mean score, ulcer incidence and ulcer index as compared to control group. The p value was significant (p < 0.05) (Table 1)

Group I C: In this group there was reduction in total score, mean score, ulcer incidence and ulcer index. The p value was highly significant compared to control group (p < 0.001) and significant as compared to standard control group (p < 0.05). (Table 1)

Group II A: In this group, the total score, mean score, ulcer incidence and ulcer index were 15, 2.5, 100% and 4.5 respectively. (Table 2)

Group II B: In this group there was reduction in total score, mean score, ulcer incidence and ulcer index as compared to control group. The p value was significant (p < 0.01) (Table 2)

Group II C: In this group there was reduction in total score, mean score, ulcer incidence and ulcer index as compared to control group. The p value was significant (p < 0.01). But the total score and ulcer index were slightly higher as compared to standard control group, and it was not statistically significant (p > 0.05). (Table 2)

DISCUSSION: Present study was undertaken to evaluate the protective effect of quercetin against ethanol and indomethacin-induced gastric mucosal damage.

Ethanol-induced gastric mucosal damage was seen in the glandular portion of stomach as elongated red streak. The fore-stomach or rumen (non-glandular portion) was spared. This may be due to squamous epithelium that covers its surface¹⁵. The ulcer lesions were confined to the mucosal crests, and this may be due to the presence of these folds at the time of exposure to ethanol¹⁶. Ethanol-induced damage to gastric mucosa is associated with a significant production of free radicals¹⁷, leading to increased lipid peroxidation. This causes damage to cell membranes.

In our study, pretreatment with quercetin in the dose of 50 mg/kg reduced total score, ulcer incidence and ulcer index as compared to control group (I A). The p value was < 0.001 (highly significant).

Quercetin is a flavonoid and has potent lipid peroxidation inhibiting property^{10,11}. As lipid peroxidation is suggested to be one of the important mechanisms of Ethanol induced gastric ulcer, quercetin probably acts by inhibiting the lipid peroxidation.

Even though ranitidine pretreated animals (I B) showed significant reduction in total score, ulcer incidence and ulcer index as compared to control group (I A) ($p < 0.05$), it was inferior when compared to quercetin pretreated group ($p < 0.05$). This indicates the superiority of quercetin over ranitidine in preventing ethanol-induced gastric mucosal damage.

Ranitidine acts by blocking H_2 receptors and thus inhibits gastric acid secretion. Ethanol-induced ulcers occur instantaneously irrespective of the acid content in the stomach. As the mechanism of gastric mucosal damage by ethanol is different, H_2 blockers are only partially effective in inhibiting ethanol-induced gastric mucosal damage. This finding correlates with the study conducted by Robert et al¹⁵.

Normal amount of gastric acid is also necessary for the development of gastric ulcers produced by NSAIDs¹⁵. In the present study, in indomethacin-induced gastric ulcer model, the total score, ulcer incidence and ulcer index in ranitidine pretreated animals (II B) were significantly reduced as compared to control group (II A) ($p < 0.01$). As the H_2 blockers reduce the gastric acid secretion, they are effective in preventing the gastric mucosal damage produced by NSAIDs. In quercetin pretreated animals (II C) even though the total score, ulcer incidence and ulcer index were significantly reduced when compared to control group ($p < 0.01$), the total score and ulcer index were only slightly higher as compared to ranitidine pretreated group (statistically not significant; $p > 0.05$). So the protection given by quercetin against indomethacin-induced gastric mucosal damage is nearly comparable to that by ranitidine.

In a study conducted by Rao CV et al, quercetin significantly decreased the acid and pepsin output of gastric contents¹¹. In another study conducted by Elango V et al, quercetin was shown to inhibit the proton pump and increase the synthesis of local prostaglandins¹⁰. Thus it appears that quercetin exerts its gastric mucosal protection against indomethacin-induced lesions by decreasing acid and pepsin content of the stomach and by increasing local prostaglandin synthesis. In another study, Yoshikawa et al reported the role of active oxygen species and lipid peroxidation in the pathogenesis of gastric mucosal injury induced by indomethacin¹⁸. As quercetin is a potent inhibitor of lipid peroxidation, it prevents indomethacin-induced gastric mucosal damage.

In our study quercetin has been found to be better than ranitidine in preventing ethanol-induced gastric mucosal damage and nearly equally effective as ranitidine in preventing indomethacin-induced gastric mucosal damage.

ACKNOWLEDGEMENT: The authors wish to thank Mrs. S. R. Itagimath for statistical help.

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ORIGINAL ARTICLE

Table 1 Ethanol-induced gastric ulcers

	Group I A (Control group)	Group I B (Standard control group) **	Group I C (Test compound group) * **
Total score	16	12	4
Mean score	2.67	2.0	0.67
Total No. of rats with ulcer	6	4	1
Ulcer incidence	100%	66.66%	16.66%
Ulcer index	4.6	3.3	1
Standard deviation	0.516	0.894	0.816

* $p < 0.001$ when I C is compared to I A

** $p < 0.05$ when I B is compared to I A & I C is compared to I B

Table 2 Indomethacin-induced gastric ulcers

	Group II A (Control group)	Group II B (Standard control group) *	Group II C (Test compound group) *
Total score	15	6	8
Mean score	2.5	01	1.33
Total no of rats with ulcer	6	2	2
Ulcer incidence	100%	33.33%	33.33%
Ulcer index	4.5	1.6	1.9
Standard deviation	0.548	0.814	0.516

* $p < 0.01$ When II B is compared to II A & II C is compared to II A

HISTOMORPHOLOGICAL VARIANTS OF NODAL LYMPHOMAS AT GANDHI HOSPITAL –A 2 YEAR PROSPECTIVE STUDY

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ABSTRACT: Lymphomas are malignant neoplasms of lymphoid tissue. **AIMS & OBJECTIVES:** The objective of the study was to evaluate the Histomorphological variants of Nodal lymphomas at Gandhi hospital for over a period of two years. **Materials & methods:** We have studied 40 out of 220 nodal biopsies which revealed histomorphology of lymphoma. IHC markers were done to type the lymphomas **Results:** Out of 40 cases 31 were Non Hodgkins lymphomas (NHL) and 9 were Hodgkins .Follicular variant was the commonest one. **CONCLUSION:** NHL was the commonest nodal lymphoma at our hospital with Follicular lymphoma predominating. Typing of the lymphomas has prognostic implications and IHC is a useful ancillary technique in the diagnosis.

KEY WORDS: Non Hodgkins Lymphoma, Hodgkins Lymphoma, Immunohistochemistry, Variants of lymphoma

INTRODUCTION: Lymphomas are neoplasm of the lympho-reticular system and arise in the lymph node or extranodal sites. They affect all age groups. They constitute 5.6% of all the cancers. This is seventh common cancer in adults and third common in children. There are aggressive and indolent variants of lymphoma with varied clinical presentation and clinical outcome. In our study we have evaluated all the nodal biopsies with lymphoma and typed them accordingly using immunohistochemistry.

AIMS & OBJECTIVES: Aim of the study was to evaluate and enumerate the Histomorphological variants of the Lymphomas in the nodal biopsies at department of pathology, Gandhi Hospital.

MATERIALS & METHODS: The present study was a prospective study done at Gandhi hospital in the department of pathology for over a period of two years from May 2010 to May 2012. During this period we received a total of 220 lymph node biopsies from various sites. All these biopsies were grossed and tissue was processed routinely and H&E stained sections were prepared. These sections were studied under light microscopy .Out of all the 220 lymph nodal biopsies, 40(18%) revealed histological features of lymphoma .These cases formed our study group. All the clinical details were acquired for these cases. All the haematological parameters

were evaluated in these patients including hemogram, bone marrow Aspiration and Bone Marrow Biopsy when needed. Relevant Immunohistochemistry markers were done for typing these lymphomas .All the results were complied and correlated for further evaluation.

RESULTS: 40(18%) out of total 220 biopsies revealed Histomorphological features of Lymphoma. Out of these 40, 31(77%) were diagnosed as Non Hodgkins Lymphoma (NHL) and the remaining 9(23%) as Hodgkins Lymphoma (HL). The diagnosis was done based on morphological features and Immunohistochemistry makers.

Amongst NHL, five variants were identified .They were Follicular lymphoma (FL), Diffuse large B cell lymphoma (DLBCL), Anaplastic lymphoma (AL), Precursor T cell lymphoma (PTCL) and Small cell Lymphoma (SLL).The age and sex distribution for each group of lymphoma is as follows:

Immunohistochemistry was done to arrive at a final diagnosis

Majority of the cases belonged to FL (61%) with mean age of 53 years with male preponderance. DLBCL formed the second major group with 26% and male preponderance and a mean age of 53 years. Anaplastic lymphoma had two cases amounting upto 7% and mean age of 50 years. PTCL and SLL had one case each constituting 3% each and both the cases were males. All the cases of HL were of mixed type with a mean age of 43 and male preponderance. In NHL various groups of lymph nodes were involved and their distribution is as follows:

Most of the cases of FL were abdominal nodes and two cases had generalised lymphadenopathy. Most of the cases diagnosed as DLBCL also had abdominal nodes and one case presented with cervical lymphadenopathy and hepatosplenomegaly.AL had one patient with abdominal nodes and other with cervical lymphadenopathy. PTCL and SLL patients presented with cervical lymphadenopathy.

All cases of HL presented with cervical lymphadenopathy.

Peripheral smears of all the patients were normal except for one patient with FL had lymphocytosis. Bone marrow biopsy of this patient showed nodular infiltration of the marrow.

To summarise in our study Non Hodgkins lymphoma is the commonest type of Lymphoma in our study with Follicular variant forming the major category. All cases of Hodgkin's lymphoma were of mixed type.

Discussion: Lymphoma is the malignant neoplasm of the lymphoid tissue. In the present scenario, diagnosis of lymphomas is based on the criteria laid down by World health Organization(WHO) which in turn is determined according to the stratification of neoplasms depending on their precursor cell and clinical status⁽¹⁾. Preliminary diagnosis of lymphomas by light microscopy always remains the standard diagnostic modality ⁽²⁾.However the typing of these tumours needs immunophenotyping and flow cytometry. These neoplasms now are explored upto the molecular level and hence genetic alterations have a vital role in categorizing these tumours and their prognosis⁽³⁾ .However the extent to which the genetic alterations define the behaviour of the tumour is still questionable⁽⁴⁾.

In our study NHL constituted more number of cases than HL. These findings were similar to the study done by Arora N etal⁽⁵⁾.However in their study majority of the cases of NHL were of Diffuse large B cell lymphoma type where as in our study we had more number of Follicular lymphomas(61%).Follicular lymphoma is the neoplasm of germinal centre B cells and is commonly associated with inappropriate activation of protooncogene on chromosome

ORIGINAL ARTICLE

18q21⁽⁶⁾. Several risk factors like sedentary lifestyle, obesity, diet high in meat and milk were proved to be the risk factors to these lymphomas⁽⁷⁾.

In our study Diffuse Large B cell lymphoma was the second major group of NHL. DLBCLs are aggressive B-cell lymphomas with varied clinical, pathological, and genetic aberrations⁽⁸⁾. To major extent these patients are cured but there is still mortality inspite of new therapeutic regimes⁽⁹⁾. Some authors have stated that BCL-6 is a marker of better prognosis and CD138 is a marker of poor prognosis for DLBCL patients⁽¹⁰⁾.

We had two cases of anaplastic large cell lymphoma (7 %). Both the cases are Alk positive. These patients have a good prognosis when compared to ALK negative patients⁽¹¹⁾. In our study we had one case each(3%) of Precursor T cell Lymphoma and Small cell lymphoma. Precursor T cell lymphoma was Tdt positive and for diagnosis of this entity Tdt positivity is mandatory⁽¹²⁾. The case of Small cell lymphoma in our study had generalised lymphadenopathy with splenomegaly. These cases have to be distinguished from Chronic lymphocytic leukemia. Both CLL and SLL are currently considered different manifestations of the same entity by the fourth edition of the World Health Organization Classification of Tumours of Haematopoietic and Lymphoid Tissues⁽¹³⁾.

In our study we had 9 cases of Hodgkins lymphoma which accounted to 23%. All the cases were of mixed type. These findings were similar to the study of Arora N etal⁽⁵⁾. Studies have shown that single nucleotide pleomorphisms play a vital role in pathogenesis of Hodgkins lymphoma⁽¹⁴⁾. Hence gene targeted therapies are of utmost utility in these lymphomas.

The world Health Organization has classified and revised Lymphomas taking in to consideration the morphology, Immunophenotype, genetic features and clinical features⁽¹⁵⁾. A careful diagnosis of type of lymphoma is desirable as it has got prognostic implications. The incidence of various variants of lymphomas in the population helps us to study the pattern of distribution of these malignancies and this may aid in formulating etiological factors there by the preventive measures. In this study we have made a similar effort and since our patients mostly belonged to low socioeconomic category we hypothesize environmental factors could be one of the major in etiology of Lymphomas.

CONCLUSION: Non -Hodgkins Lymphoma is more common than Hodgkins lymphoma. Immunohistochemistry is mandatory for the diagnosis of these cases. A thorough workup of these cases is essential and identification of variants is important in prognosis and management of these cases.

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TABEL1 NON HODGKIN'S LYMPHOMA

Histological type	No of cases	Mean age	M:F
FL	19	53	2.8:1
DLBCL	8	53	1.6:1
AL	2	50	1:1
PTCL	1	36	M
SLL	1	52	M

TABLE 2 HODGKIN'S LYMPHOMA

No of cases	9
Mean age	43
M : F	3.5:1

ORIGINAL ARTICLE

TABLE 3 TYPING OF LYMPHOMAS BASED ON IHC MARKERS

Histological type	CD 3	CD 45	CD 20	CD 5	CD 10	CD 23	TdT	ALK - 1	CD 30	Ki67%	Bcl2
FL	-	+		-	+	+				60%	+(Nuclear)
DLBCL	F+	D+	D+	-	+	-				80%	
ALCL	+	+	-	-	-			+	+	80%	
PTLL										40%	
SCLL										20%	

TABLE 4

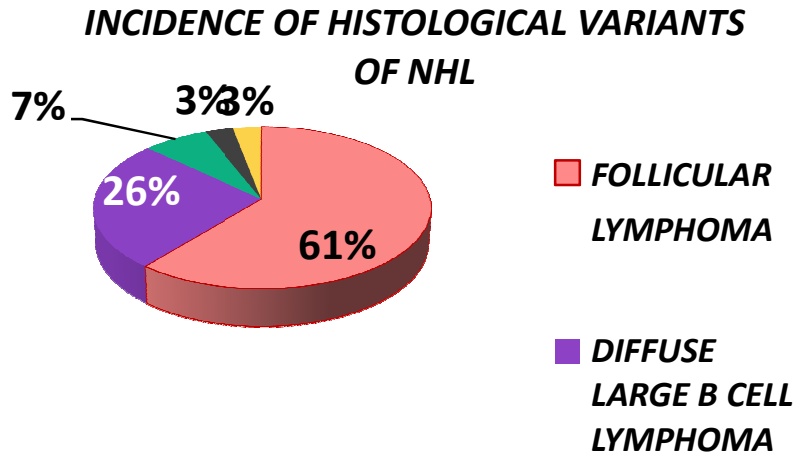
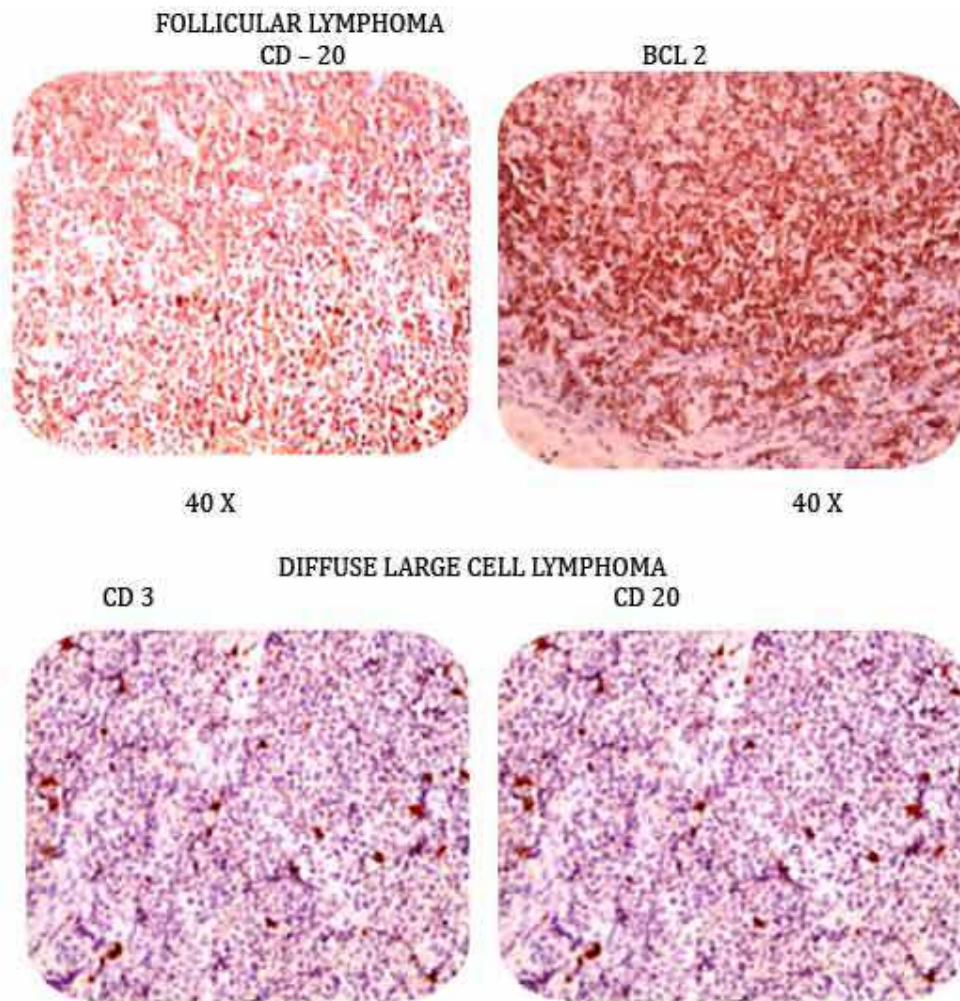


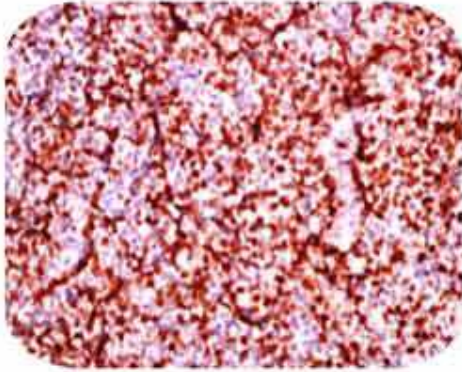
TABLE 5 GROUP OF LYMPHNODES INVOLVED

LYMPHNODE GROUP	NHL					HL
	FL	DLBL	AL	PTCL	SLL	
Abdominal lymphnodes	12	4	1			
Cervical lymphnodes	4	3	1	1	1	9
Generalized Lymphadenopathy	2	3				
Cervical with Hepatosplenomegaly		1				
Total	19	8	2	1	1	9

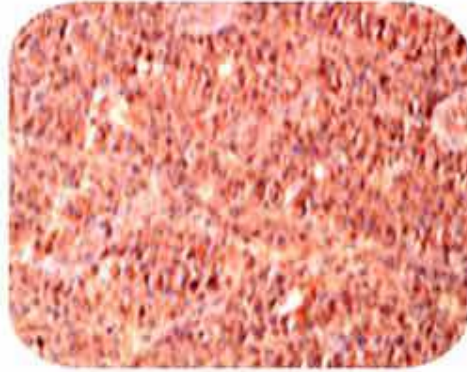


ORIGINAL ARTICLE

ANAPLASTIC LARGE CELL LYMPHOMA
CD 3

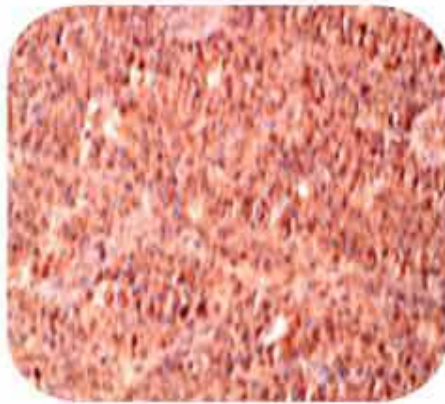


CD 30

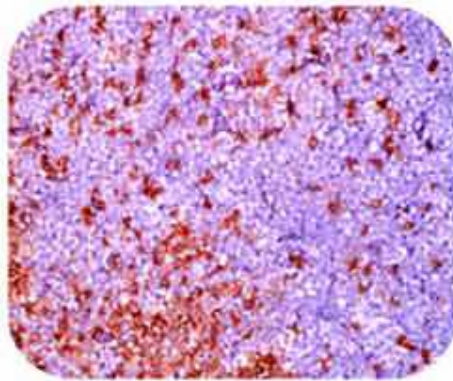


PRECURSER T CELL LYMPHOMA

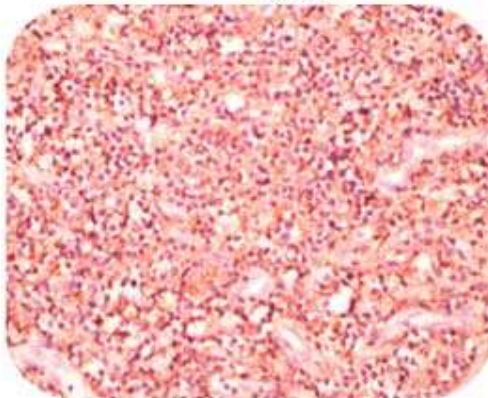
ALK 1



CD 30

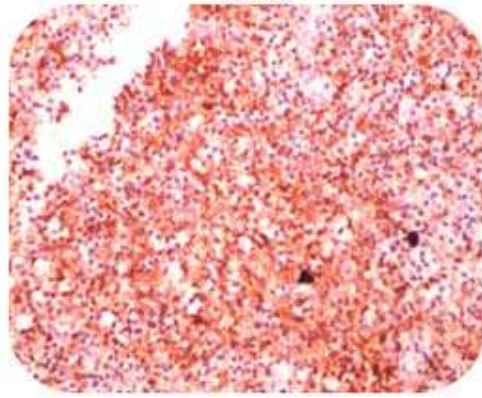


SMALL CELL LYMPHOMA
CD 20



40X

CD 23



40X

EVALUATION OF ALPHA FETOPROTEIN LEVELS AS A RISK FACTOR IN VIRAL HEPATITIS IN NORTHERN KERALA

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ABSTRACT: The manifestation of acute viral hepatitis is similar regardless of etiologic agent, but has important differences in terms of virology, epidemiology, and chronic sequelae. Hepatocellular carcinoma (HCC) is estimated to have an annual worldwide incidence of 0.25 to 1.2 million new cases per year. Both the prevalence and incidence of HCC vary markedly as a function of geography and the local prevalence of chronic viral hepatitis. Both hepatitis B and C are recognized as risk factors for HCC. The aim of the study is to assess the risk of hepatocellular carcinoma using AFP in viral hepatitis. The specific objectives are to find out comparison and correlation of parameters used in the study. The present study group consists of 80 patients and 20 controls. Serum AFP levels, bilirubin total, bilirubin direct, SGPT, SGOT, ALP, total protein, Albumin, Globulin, A/G ratio were investigated. The mean AFP level were 46.56 in patients and 1.3 in controls and is statistically significant. Except ALP, all other parameters are statistically significant. The AFP level in viral hepatitis patient was significantly correlated to the total bilirubin and direct bilirubin levels in patients. But no statistically significant correlation with SGPT, SGOT, ALP, total protein, Albumin, Globulin levels in patients. The serum alpha fetoprotein levels were found to be elevated and statistically significant in the patients under study. Hence AFP can be used as a marker for risk evaluation of hepatocellular carcinoma in viral hepatitis patients.

KEY WORDS: alpha fetoprotein, viral hepatitis, SGPT, hepatocellular carcinoma

INTRODUCTION: Viral hepatitis is an important cause of morbidity and mortality worldwide¹. It is caused by five well characterized hepatotropic agents, they are hepatitis A, B, C, Delta & E viruses². Hepatocellular carcinoma (HCC) is estimated to have an annual worldwide incidence of 0.25 to 1.2 million new cases per year³. Viral hepatitis is leading cause of liver cancer and the most common reason for liver transplantation⁴. Alpha fetoprotein (AFP), an albumin like glycoprotein is formed in yolk sac, non differentiated liver cells fetal gastro intestinal tract. AFP is normally used as tumor marker for primary hepatocellular carcinoma and germ cell tumors. As the AFP values rise during regeneration of liver moderately; elevated values are found in alcohol mediated liver cirrhosis and acute viral hepatitis as well as carriers of HBs Ag (hepatitis B surface antigen)⁵. Multiple factors are involved in the molecular pathogenesis of hepatocellular carcinoma (HCC). The activation of cellular oncogenes, the inactivation of tumor suppressor genes and over expression of certain growth factors contribute to the development

of HCC. There is increasing evidence that the hepatitis B virus may play a direct role in molecular pathogenesis of HCC⁶. Aspartate Transaminase (AST) and Alanine Transaminase (ALT) are the most commonly used markers of hepatocyte injury. ALT levels often rise to several thousands units per liter in patients with acute viral hepatitis. Patients with cirrhosis often have normal or only slightly elevated serum AST and ALT levels⁷.

In present study, AFP was used as a marker for the risk evaluation of hepatocellular carcinoma in viral hepatitis patients and correlation of AFP with liver enzymes was also evaluated.

MATERIALS AND METHODS: The present study group consists of 80 patients and 20 controls between age group 18-85. Blood samples from patients with viral hepatitis in Pariyaram, Medical College Kannur, from April 2012 to July 2012 were included for the study with their consent. All these cases were screened either for HBs Ag or Anti HAV or Anti HCV and all positive cases were considered as patients. Those who were negative for HBs Ag, Anti HAV and Anti HCV were considered as control group. Detailed baseline clinical data of each patient including age, sex, present and past clinical complaints, family history and associated complaints were noted.

The following biochemical tests were done in patients and controls included in the study like, determination of serum alpha fetoprotein, serum total and direct bilirubin level, serum SGPT, SGOT, total protein, albumin, globulin and A/G ratio. All investigations were done using AU400 Beckmann fully automated analyzer and the Roche diagnostics Elecsys 2010 immunoassay system. Statistical analysis is done using SPSS 17.0

RESULT: The present study group consists of 80 patients and 20 controls between age group of 18-85, who were referred to Medical College Hospital Pariyaram, during the period from April 2012-July 2012.

In the study group, 3 female patients were less than 20 years of age, 5 female patients belonged to 20-30 years age group, 4 female patients each were in the age group 30-40 years and 40-50 years respectively and 9 female patients were more than 50 years old. Among the male patients studied, 12 belonged to the age group 20-30 years, 8 were in the age group 30-40 years, 9 were in the age group 40-50 years and 26 were in the age group of more than 50 years. In the control group, only 1 female belonged to age group 20-30 and 30-40 years and 3 female controls were more than 50 years. Among the male controls, 2 belonged to the age group 20-30 years, 3 were in age group 30-40 years, 6 were in age group 40-50 years and 9 were in the age group of more than 50 years.

Mean level of total bilirubin in patient is 3.24mg/dL and mean level in control is 0.68mg/dL. The p-value is <0.05, so it is statistically significant. The P-value of direct bilirubin is <0.05, which is statistically significant. The mean level of direct bilirubin in the patients is 1.40 and in control is 0.12mg/dL. The SGPT level is statistically significant with a P-value 0.023. The mean value of SGPT in patients is 163.39IU/L and in control is 26.4 IU/L. The mean value of SGOT in patients is 177.72 IU/L and in control is 23.55IU/L. The P-value of SGOT is <0.05, which is statistically significant. The P-value of ALP is >0.05, so it is not statistically significant. The mean level of ALP in patients is 139.49IU/L and in control is 69.65IU/L. The P-value of total protein is 0.005, so it is statistically significant. The mean level of total protein in patients is 7.3g/dL and in control is 7.8g/dL. The P-value of albumin is 0.05,so it is statistically significant. The mean value of albumin in patients is 3.8712g/dL and in control is 4.625g/dL. The P-value of

ORIGINAL ARTICLE

globulin is 0.009 so it is statistically significant. The mean level is 3.4188g/dL and in contact is 3.175g/dL.

DISCUSSION: In the present study serum alpha fetoprotein levels were significantly higher in patients with viral hepatitis than control and was statistically significant (P=0.037). The total and direct bilirubin, SGPT and SGOT levels were higher in patients than control and statistically significant. The ALP level were higher in patients but not statistically significant (P=0.051). The total protein and albumin levels were slightly lower in patients than control and statistically significant. The globulin levels in patients were higher than control and statistically significant (P=0.009).

The AFP levels were positively correlated with total and direct bilirubin levels in patients and also statistically significant (P<0.01). The AFP levels has a correlation with SGPT, SGOT, ALP, total protein, albumin and globulin but not statistically significant (P>0.01).

Thus, in the present study , AFP levels correlate well with the extent of liver damage as indicated by the rise in liver enzyme levels as well.

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Variation between the patients and control group with AFP level

GROUP	N	MEAN	STD. DEVIATION	P-VALUE
AFP PATIENT	80	46.57	183.67	0.037
CONTROL	20	1.30	0.45	

This table gives group statistics of parameters of patients and control. The mean level of AFP in patients is 46.57ng/mL and mean level in control is 1.30ng/mL. The P-value is < 0.05, so it is statistically significant.

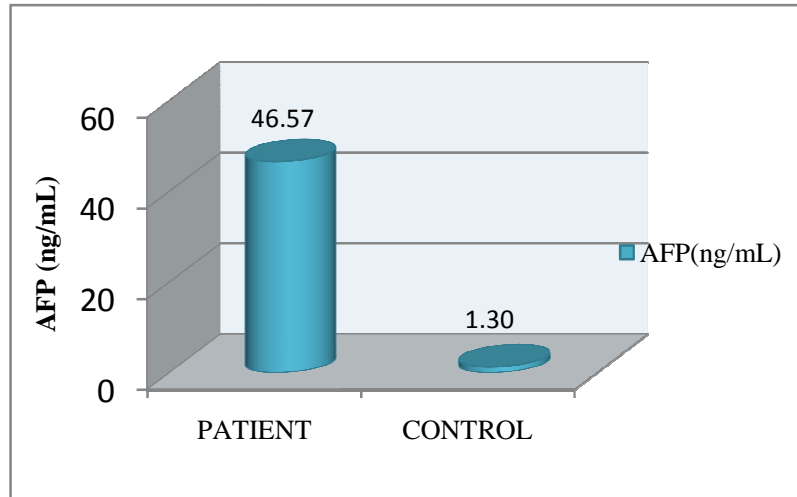
ORIGINAL ARTICLE

Correlation of AFP with different parameters

		BB TOTAL	AFP
AFP	Pearson Correlation	0.404	1
	Sig. (2-tailed)	0	
	N	80	80
		BB DIRECT	AFP
AFP	Pearson Correlation	0.321	1
	Sig. (2-tailed)	0.004	
	N	80	80
		SGPT	AFP
AFP	Pearson Correlation	-0.057	1
	Sig. (2-tailed)	0.617	
	N	80	80
		SGOT	AFP
AFP	Pearson Correlation	0.004	1
	Sig. (2-tailed)	0.969	
	N	80	80
		ALP	AFP
AFP	Pearson Correlation	0.124	1
	Sig. (2-tailed)	0.272	
	N	80	80

Correlation of AFP with different parameters

		TOTAL PROTEIN	80
AFP	Pearson Correlation	-0.144	1
	Sig. (2-tailed)	0.203	
	N	80	
		ALBUMIN	AFP
AFP	Pearson Correlation	-0.156	1
	Sig. (2-tailed)	0.166	
	N	80	80
		GLOBULIN	AFP
AFP	Pearson Correlation	0.041	1
	Sig. (2-tailed)	0.716	
	N	80	80



Variation between the patients and control group with AFP level

A STUDY OF PAIN PERCEPTION DURING THE DIFFERENT PHASES OF MENSTRUAL CYCLE

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ABSTRACT: Animal and human research has shown that pain perception changes across the menstrual cycle. This has sometimes been attributed to hormonal variation. The aim of the present study was to examine how perception of pain, induced by cold pressor test in dominant hand, is related to phases of the menstrual cycle. Twenty-five female students were included in the study. The cycle phase during which each woman began her participation was randomized. Pain was induced using the cold pressor test. Pain threshold was determined as the duration of time between the subject's first reported pain and exposure to the painful stimulus. Pain tolerance was determined as the duration of the time until the subject withdrew her hand from the cold water as the pain was too intensive. The results showed that both the mean pain threshold and mean pain tolerance were significantly higher in follicular phase compared with luteal phase. We can conclude from our study that pain perception varies across the menstrual cycle as shown by higher pain threshold and tolerance during follicular phase of menstrual cycle.

KEY WORDS: menstrual cycle, pain threshold, pain tolerance.

INTRODUCTION: In general, the human menstrual cycle is divided into three phases: the follicular phase, ovulatory phase and luteal phase. This cycle is regulated by variation in gonadal hormones such as estrogen and progesterone.

Evidence from an epidemiological study have found that there is an increased risk of temporomandibular disorder pain in young women using oral contraceptives and in postmenopausal women on hormone replacement therapies (1). Additionally, a large proportion of women report increase in pain-related symptoms at certain phases of menstrual cycle such as premenstrual migraines (2). Reproductive life events and sex hormone alterations have also been found related to fibromyalgia, rheumatoid arthritis, and irritable-bowel syndrome (3-5). Cyclical fluctuation of gonadal steroids may provide a partial explanation for

the increased pain perception that has been reported in women, a possibility also suggested by compelling clinical evidence that a very common episodic pain syndrome, migraine, often recurs in women with a clear-cut menstrual periodicity (6). Similarly, several animal studies suggests that gonadal hormones could influence response to painful stimuli among female, for instance, response to noxious stimuli are influenced by estrous cycle phase in rats and stress-induced analgesia varies across the estrous cycle in rats (7,8).

However, the results of numerous pain studies conducted in women, examining possible variations related to the menstrual phase, in response to experimentally induced noxious stimulation showed no conclusive findings (9-11). The present study was conducted to examine how perception of pain, induced by cold pressor test in dominant hand, is related to the phases of the menstrual cycle.

MATERIAL & METHODS: This study was conducted among the first year MBBS students (2010-11 batch) of the Jawaharlal Nehru Institute of Medical Sciences, Imphal. Twenty Five female students volunteered for the study all of whom fulfilled the inclusion criteria; age between 18-22 yrs, regular menstrual cycle (28 ± 4 days) and Body Mass Index (BMI) < 28 Kg/m². The exclusion criteria were gynecological diseases, endocrine disorders, hormonal therapy, drug abuse, alcohol intake, acute and chronic pain as well as dermatosis at the site of the pain stimulation. Each student underwent test in two different phases of the menstrual cycle (days 2-4 and days 20-24). The students were told not to use pain medication 24 hours before the test. The cycle phase during which each student began her participation was randomized.

COLD PRESSOR TEST: It was used as a stimulus source. The dominant hand was immersed up to the wrist in ice chilled water ($40 \text{ C} \pm 10$). The water bucket (2.8 lits) was shaken manually by the experimenter every 30 second from warming up around the skin. The temperature in the bucket was measured by mercury thermometer (INCO immersion thermometer) and was made not to exceed 6° C. The participants were instructed to hold their hands as long as they could bear the pain and to inform when pain is first felt. Pain threshold was determined as the duration of time between the subject's first reported pain and exposure to the painful stimulus. Pain tolerance was determined as the duration of the time until the subject withdrew her hand from the cold water as the pain was too intensive.

Informed and written consent were taken from the students after explaining the details of the test and were told that anyone could walk out from this study at any time without giving reason. The research was carried out after taking the clearance from the ethical committee of the Institution. It was done using SPSS 13. All the values were expressed as mean \pm SD. Comparisons were done using students "un-paired t test". Statistical significance was considered to be present when the two-tailed probability was less than 0.05

RESULTS: The table 1 shows comparison of pain threshold and tolerance between the follicular phase and luteal phase of the menstrual cycle. The mean pain threshold was significantly higher in follicular phase compared to luteal phase ($p < 0.05$). The mean pain tolerance is found to be higher in follicular phase as compared to the luteal phase ($p < 0.01$).

DISCUSSION: The present study have shown higher pain threshold in follicular phase of the menstrual cycle. Stening et al (9) demonstrated that the follicular phase has longer activation

time as compared to luteal phase during the hand cold pressor. Teepker et al (12) have also revealed from their study on thirty-two healthy and pain free women having regular menstrual cycle that the pain threshold increased during the menstrual cycle from day 1 to day 14 for cold. In contrast to our study, Hellstrom and Lundberg (10) revealed a significantly higher pain threshold during the second half of the menstrual cycle. Furthermore, Kowalczyk et al (11) found no significant changes in cold pain threshold as a function of menstrual cycle phase.

Our study also showed higher pain tolerance during the follicular phase of the menstrual cycle. Hapidou and de Catanzaro (13) reported higher pain tolerance during the follicular period which is similar with our study. However, Stening et al (9) have reported no significant changes in the pain tolerance time of the cold pressor test during the menstrual cycle in sixteen students. This could be due to the fact that they have kept the cut-off limit for tolerance time as 300 seconds in which many participants had reached the cut-off limit.

It is difficult to explain from the present study that pain perception alters with the phases of menstrual cycle. However, previous study demonstrates less pain sensitivity during phases of the menstrual cycle associated with high estrogen (14). Many estrogen receptor expressing neurons are opioidergic (15) and show increased opioid transcription upon 17 β -estradiol administration (16). Previous study also reveals ovarian sex steroid antinociception as opioid mediated and results from the activation of spinal cord κ and δ opiate receptors (17). However, another study on animals show estradiol does not consistently modulate sensitivity to analgesic effects of opioids in the adult organism (18).

Stening et al (9) demonstrated a significant correlation between the S-progesterone level and reduced activation time during the luteal phase suggesting progesterone to be pronociceptive. Animal studies indicates that the induction of luteinizing hormone (LH) surge leads to a diminished analgesic response to morphine resulting from desensitization of brain opiate receptors (19). Thus, one can speculate that hormonally induced (ovulation) opiate receptor desensitization could enhance luteal phase pain sensitivity among women.

We can conclude from our study that pain perception varies across the menstrual cycle as shown by higher pain threshold and tolerance during follicular phase of menstrual cycle.

LIMITATION OF THE STUDY: In the present study the sample size was relatively small. Another limitation is the non-assessment of the hormonal level in our study.

ACKNOWLEDGEMENT: We would like to thank R. K. Pritam and L. Biseshwor for their technical assistance.

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Table 1: Comparison of pain threshold and tolerance between follicular phase and luteal phase.

Pain	Follicular phase (mean±SD)	Luteal phase (mean±SD)
Threshold (seconds)	24.52±12.89*	14.80±7.24
Tolerance (seconds)	25.56±27.97**	17.68±7.24

P* < 0.05; p** < 0.01

“ASSESSMENT OF DIFFERENT TEACHING AIDS AND TEACHING METHODS FOR THE BETTER PERCEPTION OF BIOCHEMISTRY BY 1ST MBBS STUDENTS”

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ABSTRACT: BACKGROUND: Medical students during their first year of MBBS course, find Biochemistry difficult and volatile. In this regard, we studied the feedback from students about the effectiveness of prevailing teaching aids and methods, so that best teaching aid and method can be adopted to improve their academic performance. **METHODS:** This study comprises of total 117 students of 1st MBBS course, who have completed the 2nd semester of academic year 2011-12. Irrespective of the teacher and topic, the students were asked to grade the teaching aids and methods that were used to teach Biochemistry for the period of 10 months (from August 2011 to May 2012). **RESULTS:** In our study high Satisfaction Index (SI) was noticed for combination method of teaching aid (blackboard+ PowerPoint*(PPT)) and teaching preceded and followed by asking questions + assessment + tutorials, teaching method. **CONCLUSION:** This observation may probably be due to the fact that, inherent deficiency of each teaching aid is compensated by the other. With regard to teaching method, the combination of teaching methods is more effective when compared to didactic lectures. **KEY WORDS:** Satisfaction index, Teaching aids, Teaching methods.

INTRODUCTION: Biochemistry is an essential component of medical curriculum worldwide. During initial years, the Biochemistry course consisted of teaching organic chemistry of substances of physiological importance, nutrition, metabolism and hormones. Later clinical biochemistry, genetics and molecular biology were introduced. Now most of the organic chemistry content has been removed and greater emphasis is placed on clinical correlations.

Use of teaching aids in medical education technology is swiftly changing from blackboard to virtual simulations and teaching methods range from lectures to integrated teaching.(1)

Medical students during their first year of MBBS course, find Biochemistry as difficult and volatile subject.

In this regard, we intend to study the feedback from students about the effectiveness of prevailing teaching aids and methods, so that best teaching aid and method can be adopted by teachers to improve the academic performance of the students and to make learning more interesting and effective.

ORIGINAL ARTICLE

MATERIAL AND METHODS: The study was conducted in the Department of Biochemistry, of a Medical college with study comprising of 117 1st MBBS students who have recently completed their 2nd semester.

Teaching-aids used in study were

1. Black board alone
2. OHP (Over Head Projector) alone
3. Power Point presentation (PPT) alone
4. Over Head Projector (OHP) + Black board
5. PowerPoint presentation (PPT) + Black board

Irrespective of the teacher and topic, the students were asked to grade the above mentioned teaching aids as below.

A grade: most helpful to understand, remember and reproduce.

B grade: more helpful to understand, remember and reproduce.

C grade: helpful to understand, remember and reproduce.

D grade: not helpful to understand, remember and reproduce.

E grade: not at all effective

Further the students were asked to grade the following teaching methods

1. Teaching followed by assessment/test
2. Teaching followed by tutorials (small group discussion by the teacher)
3. Teaching preceded and followed by asking questions
4. Teaching preceded and followed by asking questions + assessment + small group discussions
5. Teaching followed by self study/ group study.

Students were given option to suggest any other teaching method which would improve their academic performance. After obtaining informed consent, the students were encouraged to furnish their unbiased independent opinion regarding the above study.

The response obtained from the students was statistically treated to calculate the high Satisfaction Index (SI) for Teaching aids and Teaching methods separately. (1)

RESULTS: The following bar diagram shows the opinion of 1st MBBS students towards the various Teaching aids used for conducting biochemistry Theory classes.

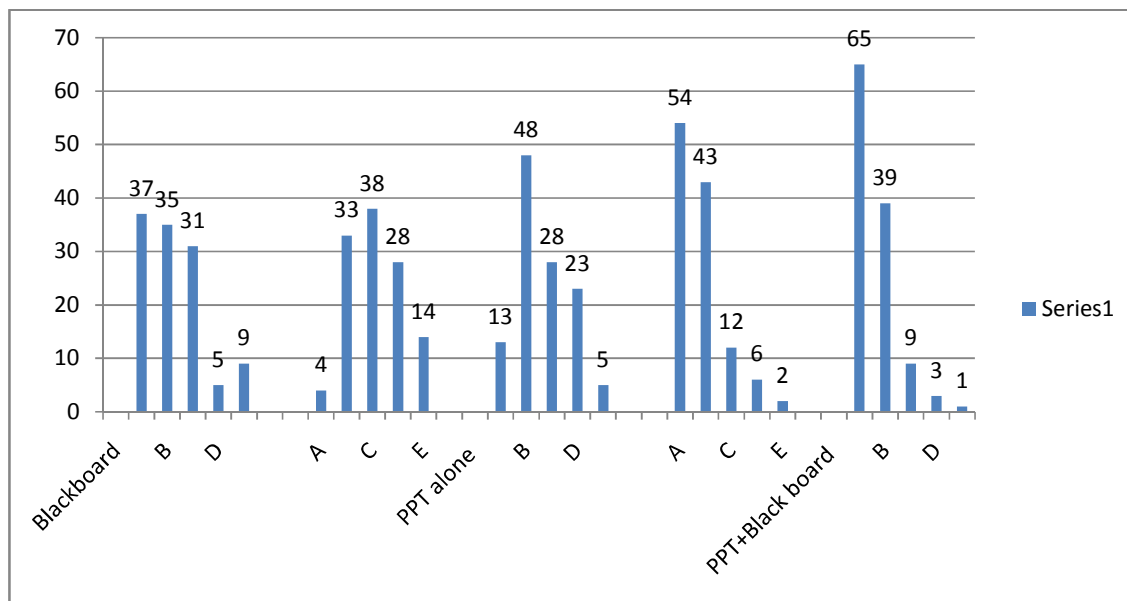


Fig 1: Graph showing opinion of 1st MBBS students towards the various teaching aids used for conducting Biochemistry theory classes. (X-axis= teaching aids and Y-axis = No. of students)

Power point presentation in combination with Blackboard (66%) was the most helpful teaching aid to understand, remember and reproduce; followed by combination of OHP and blackboard(46%)

So in our study high satisfaction index was noticed for blackboard + PPT teaching aid.

When teaching aids were individually considered, surprisingly blackboard (31%) was preferred (A grade) over OHP (11%) and Power point (3.4%) the newer Teaching aids. The following bar diagram No.2 shows the opinion of 1st MBBS students towards the various teaching methods used for conducting Biochemistry Theory classes.

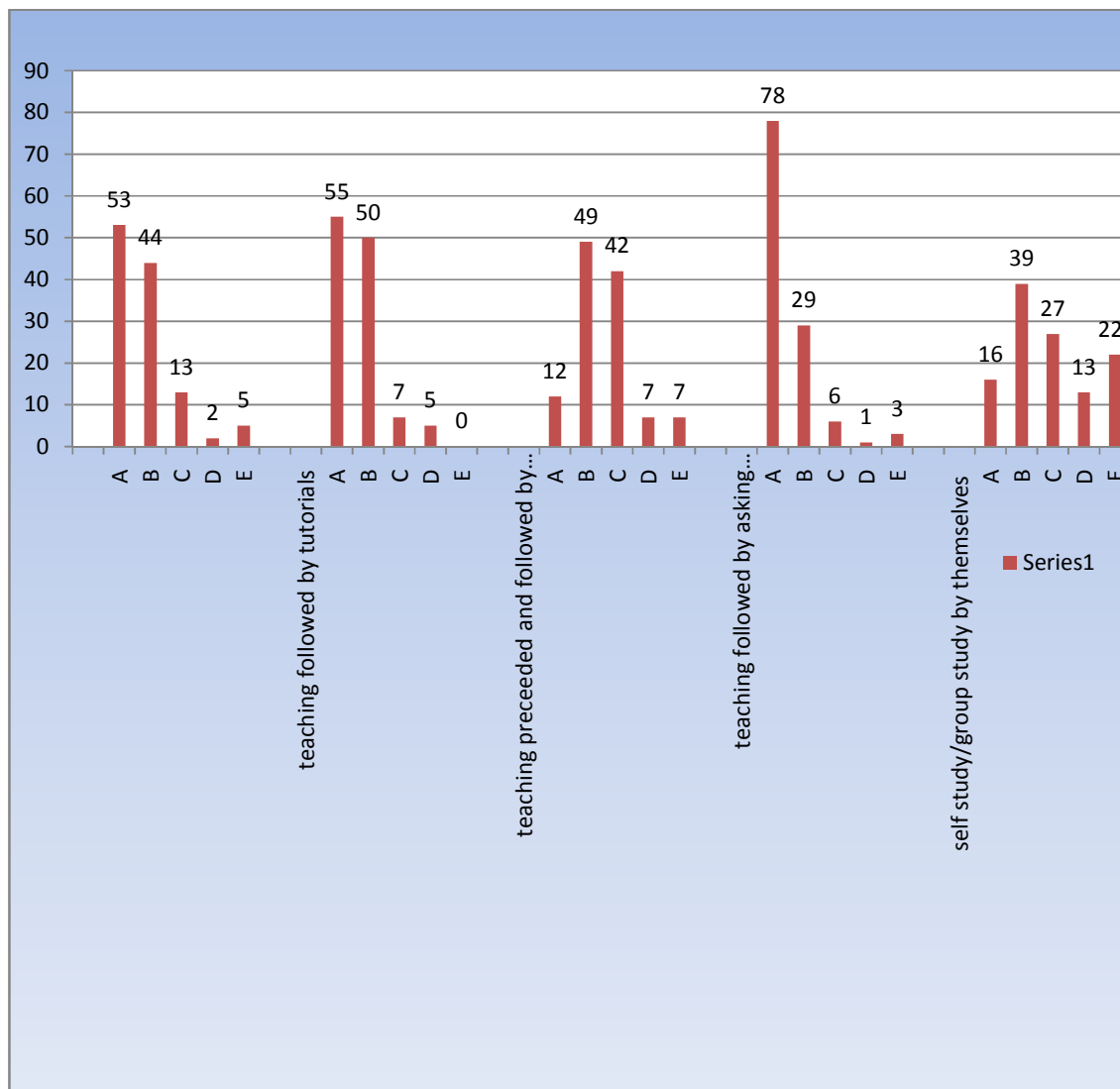


Fig.2: Graph showing opinion of 1st MBBS students towards the various teaching methods used for teaching Biochemistry theory classes. (X-axis= teaching methods and Y-axis =No. of students)

The above graph shows that teaching preceded and followed by asking questions + assessment + small group discussion (66.6%) was considered as the most helpful teaching method to understand, remember and reproduce (A grade) when compared to teaching followed by tutorials (47%), teaching followed by assessment/test (45%), teaching followed by self study / group study (13%) and teaching preceded and followed by asking questions (10.7%).

So in our study high Satisfaction Index (SI) noticed for teaching preceded and followed by asking questions + assessment+ tutorials (66.6%) teaching method 5.

Suggestions/opinions given by the students on different Teaching aids and Teaching methods are :

1. Few students opine that exclusive Power Point Presentations are irritable because the lecture hall will be converted to dark Hot Air Oven and they cannot concentrate on the lecture.

2. Video Presentations to be used as and when required.
3. Seminar Presentations will be helpful.

DISCUSSION: Teaching is an art. By making use of best teaching aid, teacher can teach and make the students understand, remember and reproduce well; thus improving the academic performance of students.

Different technologies are becoming ubiquitous in classrooms. The use of better teaching aid allows the students to understand the metabolic pathways, cycles, flowcharts, structures and diagrams better. This also allows more time for interaction and further understanding. Use of technology can be a very beneficial and time saving tool for all teachers.

An evaluation by the students can provide the teacher with useful feedback information regarding the best Teaching aid and Teaching method.

In our study, students preferred combination of teaching aids rather than individual teaching aid. Among the two prevailing combination teaching methods, majority of the students have opted PPT + Black board as their preferred aid for the better perception of subject.

This observation may probably be due to the fact that, inherent deficiency of each method is compensated by the other. While blackboard teaching is deficient in showing three dimensional diagrams, animated videos and sounds; the same can be demonstrated using a Power Point presentation. Power Point presentations take less time to present the same information as compared to Black Board teaching. Blackboard teaching allows the students to take down the notes and diagrams which is difficult with Power Point presentations as there is tendency to deliver the lecture fast (2).

Our study can be compared with the study done by Chaudhary R (2009). In their study also majority of the students (67.1%) favored the combination of teaching aids. The drawback which the students pointed in Black Board teaching, is that it takes time to draw a labeled diagram on the board and during that time teacher's eye contact with the students is interrupted.(3)

Roopa kulkarni (2011) and co-workers in their study, have also concluded that audio-visual aids enhance the effectiveness of the Blackboard Teaching. (4)

A Garg (2004) have taken the students opinions on the prevailing Teaching methods in Pharmacology and showed that 81% of the students wanted the teacher to make use of audio visual aids during the lectures.

If we consider the individual teaching aids that is not in combination, Blackboard Teaching was opined as most helpful to understand, remember and reproduce (A grade) teaching aid. Teaching using OHP alone and PPT alone was opined not effective at all.

The points which favour Chalk and Talk method are :

1. The rooms will be illuminated
2. Teacher can hold the attention of students and students can cope with the speed of the teacher
3. It increases the ability of the students to think and understand the contents and simultaneously take down the notes and write the diagrams.

ORIGINAL ARTICLE

4. Student teacher interaction will be better
5. No interruption because of power failure.

S. N. Baxi (2009) in their study showed that an equal number of students preferred Blackboard based or multimedia-based lectures. (6)

In few studies like Seth (2010) who have compared the preference for teaching aid between medical students versus dental students. The medical students have preferred PPT whereas the dental students preferred the Chalkboard. (7)

TEACHING METHODS: Now 1st MBBS duration has reduced from 1 ½ years to 1 year. This duration should be effectively used to get best outcome from the students. In this view we assessed best teaching methods for best perception by the students.

The results from the cognitive sciences provide insights into the neurological basis of memory formation and learning. Learning involves three steps: acquisition of information (physical encoding in the brain), its retention and the ability to retrieve the information when needed. (8)

We found that teaching preceded and followed by asking questions + small group discussions + assessment/tests (in the form of MCQs or essay type questions – chapter wise) was opined as best teaching method by the students.

This observation may be due to; asking of questions of previous lecture would make the students to read and come for ongoing lecture and it acts as bridge for the next concepts. Asking questions in between and after the class will keep the students to be attentive throughout ongoing lecture and also it breaks the monotony; an inherent component of didactic lectures. A discussion will allow students to clear their queries. The unit tests are helpful as they allow students to study the limited portion of syllabus thoroughly and also to learn writing techniques and time management skills.

Our study results also support the concept of multiple intelligences in learning identified by Gardner and Kolb's Experimental Learning Cycle theory of learning. (8)

In a study done by Roopa kulkarni (2011), their students opined that questioning in the class room is not only helpful for better understanding of the concept but also helps in developing communication skills. In the same study, 67% of the students wanted mixture of lectures and small group Teaching. (4)

CONCLUSION: Combination Teaching aid is most satisfied Teaching aid because the inherent deficiency of one aid is compensated by the other. If individual teaching aids are considered Blackboard teaching aid is most satisfied because students can follow the teaching and understand the concept effectively.

Combination of teaching preceded and followed by asking questions + small group discussions + assessment/tests is most satisfied teaching method because the student is actively involved and more learning takes place. Judicious use of different methods increases the understanding, remembrance and reproducibility and thus the academic performance of the

student.

ACKNOWLEDGEMENTS:

1. 1st year MBBS students (Batch 2011), RRMCH, Bangalore-40.
2. Dr. Vittal BG, Associate Professor of Biochemistry, BIMS, Bidar, Karnataka, Pin-585 401.
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- Microsoft PowerPoint is the name of a proprietary commercial software presentation program developed by Microsoft.
- Only the curious will learn and only the resolute will overcome the obstacles to learning. The quest quotient has always excited me more than the intelligence quotient.
- Eugene S. Wilson**

CONTAINMENT OF CASE-FILE CONTAMINATION--INFECTION CONTROL

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ABSTRACT: Medical charts could be potential vehicle for the spread of nosocomial infections (NI) as these come into direct contact with health care professionals whose hands may be contaminated. A prospective study was undertaken to determine the extent of contamination on this media of infection-transfer, which comprised of sampling of 60 randomly selected case files from Intensive care units and wards of a tertiary neurocare centre. The samples were collected from the exposed outer surface of the patients' files with sterile swabs moistened with sterile normal saline. The swabs were inoculated into trypticase soy broth and incubated at 37°C for 48 hours and plated on to blood agar and Macconkey media. The microorganisms isolated were identified at the microbiology laboratory as per standard guidelines. The study showed that majority of the hospital charts were contaminated. Coagulase-negative staphylococci (CNS) was the peak contaminant isolated (44.46%). Major number of hospital personnel may not wash their hands after handling the file, potentially placing themselves at risk of acquiring or transferring NI. Hand washing(HW) being the principal method to forestall the spread of NI, we encourage the staff members to observe hand hygiene emphasizing on alcohol rub after reviewing the patients charts and before patient contact.

KEY WORDS: cross infection, hand contamination, patients' charts, intensive care units; medical records

INTRODUCTION: Nosocomial / Hospital Associated Infections, (NI) / (HAI), have become an increasingly recognized problem and are a significant hazard for hospitalized patients. These require identification and control of sources of infection and are largely preventable with proper infection control implementation and is based on breaking the chain of infection¹

The source of the infectious agent and the transmission route are important elements in transmission of infection in hospital setting. The transmission between staff and patients should

be kept to a minimum as patient management involves contact with the hands of healthcare workers/personnel (HCW/P).²

Commonly used items such as stethoscopes, latex gloves, and white coats and writing pens, have been noted to be contaminated with various bacterial species some of which are pathogenic.³

Patient hospital charts are usually handled by several healthcare workers whose hands could be contaminated by bacterial isolates, often taken into patients' rooms, even isolation rooms where patients are barrier nursed, and may be placed on patients' beds. Patients' notes may therefore act as a vehicle for cross-infection by contaminating the hands of HCW², hence work as most common fomites in spreading NIs. Physicians, nurses, and clerks are all routinely exposed to NI as they leaf through the clinical chart.⁴ However, most HCP do not wash their hands between the contact with the medical charts and the patients.¹

The Centers for Disease Control and Prevention (CDC), points out the well documented effective hand washing (HW) as the principal, important measure for preventing spread of pathogens.^{1,5}

A well-practiced infection control plan that encompasses hand hygiene, environmental decontamination, surveillance and contact isolation is effective for prevention of such nosocomial infections. Despite these measures, colonization of potentially pathogenic organisms on various objects, such as stethoscopes, bronchoscopes, pagers, ballpoint pens, patient hospital charts, computer keyboards and mobile phones, has been reported as a potential vehicle for transmission of nosocomial pathogens from HCWs and have all been found to harbour viable bacteria.^{6,7}

The extent to which bedside patients' files become contaminated and the range of bacterial flora attributable to contamination in high-risk areas of the hospital are not known with certainty.⁸ Their role in the transmission of potential pathogens has not been examined extensively.⁵

This study was undertaken to investigate the extent of contamination of patients' charts in different areas as a media of infection transfer; to analyze and characterize the isolates as environmental flora, potentially pathogenic and pathogenic bacteria, compare the spectrum of contaminant bacterial flora and the patients' isolates in different areas of the hospital in terms of antibiotic resistance patterns.

MATERIAL AND METHODS: The present study was conducted at a tertiary care Neurocentre. A random selection of clinical charts- 60 case files from different wards and ICU's was made: 5 each from 3 ICUs, 3 surgery wards and 6 other wards. Samples were collected from the exposed outer surface of the patients' files-along the spine of the case file and the right front lower corner where most hand contact occurs while reading notes, with sterile swabs moistened with sterile normal saline.

The cotton swab was immediately inoculated into trypticase soy broth and incubated at 37°C for 48 hours, then subcultured on to trypticase soy agar, 5% sheep blood agar and MacConkey's agar.

The isolates were subjected to Gram's stain, catalase and oxidase tests; tube coagulase test and cefoxitin disc diffusion method, were performed on Staphylococcus species and the organisms were identified using standard laboratory techniques at the Hospital Infection Surveillance System unit of the Department of Neuromicrobiology.

ORIGINAL ARTICLE

Antibiotic susceptibility of the isolated bacteria was evaluated by the Kirby Bauer disk diffusion technique.

The presence in a ward, of a patient known to be currently colonized or infected with MRSA was considered but none of them stationed MRSA patients.

RESULTS: Of the 60 charts sampled, 56 (93.4%) were contaminated by potentially pathogenic, environmental or pathogenic bacteria. Coagulase- negative staphylococci (CNS) was the peak contaminant in both wards and ICU, isolated (44.46%) from the patients' files categorized as potentially pathogenic. Gram positive bacilli (*Corynebacterium* spp) was the next common isolate (38%) categorized as environmental contaminant hence were deemed to be environmental flora.

Among the pathogenic, *Klebsiella pneumoniae* and Non-fermenting gram-negative bacteria (NFGNB) (*Acinetobacter* spp) contributed to 4.76% each and *Providencia rettgeri* (*P. rettgeri*) 3.17% of the growths. The ratio of the other less common isolates (figure-1) and comparison of contamination of the patients' charts are depicted in table-1. More than one (two organisms each) were isolated from seven charts.

The kind of isolated microorganism from patients' samples correlated with the isolated ones from contaminated files. On comparison, the multidrug-resistant (MDR) *Klebsiella pneumoniae* and NFGNB and *P. rettgeri* isolated from the patient's files had same antibiotic resistance patterns as of these bacteria isolated from the patients in respective wards (EICU, PNSW).

DISCUSSION: The contamination varies in different hospitals and in different parts of the world which can be related to the infection control practices in different hospitals. Research in the contamination of the patients' charts in a large district general hospital in the UK found a 99.6% contamination rate) ² which matches the outcome of our study. In comparison, two studies in Saudi Arabia,^{5,8} also found 57% to 100% of the patients' charts contaminated with pathogenic or potentially pathogenic bacteria similar to our study (93.4%), which shows that majority of the hospital charts are contaminated by bacteria with most of the isolates being environmental organisms. These charts are probably contaminated by the hands of HCWs as some of the organisms are known to be part of normal skin flora.

A study documents isolation of CNS from all patient charts (100%)³ importantly revealing a very high ratio of charts positive for CNS, a potentially significant source of nosocomial infection in susceptible healthcare workers and their patients; in comparison, our study revealed 44.46% of CNS from the charts. It is found throughout hospitals, especially in patients with indwelling catheters commonly seen in our hospital set-up.

In our study, we observed that the pathogenic bacteria were not found as contaminants on the charts in the neurosurgical and neuromedical intensive care units (ICU), which caters to elective cases where the awareness and implementation of the infection control practices is optimal in these areas due to continuous monitoring and supervision of activities of the health care personnel by the infection control team. Whereas the emergency ICU being a busy and clustered area of the hospital appeared to harbour most of the pathogenic organisms explaining the probable breach or not so strict adherence to control practices despite conscious efforts due to emergency and high demand of patient care and management. The female and male surgical wards did not record the isolation of pathogenic bacteria indicating the compliance and adherence to infection prevention measures in these sections of our Institute (table-2).

ORIGINAL ARTICLE

The results of this study showed the isolates from the patients' charts had the same antibiogram of the corresponding bacteria isolated from the patients, which certainly has an impact on nosocomial infections.

There are many potential sources of microbiological contamination in hospitals and can infect whole hospital unless stringent controls are observed.

The vector of transmission may be as innocent as a medical chart, as it is conveyed from nurses' station to the bedside and back again⁴. The patient's chart is exposed daily to the bed-side clinical practice, may be casually placed on bed or in the bed clothes of an infectious patient. Physician and nurses are all routinely exposed to nosocomial infection as they handle the clinical chart. The personnel though would have washed hands after handling the first patient may not after handling that patients' chart.. During ward rounds transfer of the bacteria quickly occurs by these employee. They often cover number of wards in a single ward round and patient themselves may be transferred from one ward to another during the course of a single day.⁴

While bacteria on the patient clothing, bed linen continue to grow, as other healthcare professionals having failed to wash hands inadvertently transfer the bacteria to the patient's charts, on uniform, equipment in the ward as well as other patients. Thus spread to a number of wards and even beyond the hospital itself and also as visitors enter and leave the hospital. Additionally, staff may wear potentially infected uniform as they return home at the end of their shift. The potential for cross infection in the hospital still persists despite continuing extraordinary efforts to isolate hospital personnel by the use of glove, mask, gown etc.

Multiple methods like disposable covers, periodic wiping with antiseptic solutions, autoclaving and irradiation of sterilizing the charts have been described, but frequent HW before and after chart handling remains the cost-effective method of choice⁴. With HW, the healthcare personnel (HCP) is protected from patient cross-contamination, and conversely, the patient and coworkers are sheltered,⁴ but this behavioural change remains a formidable obstacle.

As cleaning and disinfecting the non-critical items is difficult HW remains the cornerstone of infection control. The maintenance of good hand hygiene by the HCWs after handling contaminated files should perhaps be the most prudent approach to prevent patient-patient transmission of infection in high-risk areas including ICU and surgical wards.

The outcome of this study delivers the message that development of effective preventive strategies is an essential need to contain nosocomial infections one among them being contaminated chart.⁷ The patient chart should not be allowed to be placed on bed, but remain on the chart rack after use⁹ and medical chart covers need to be cleaned by periodical wiping of the chart covers with appropriate detergents, antiseptic solution or alcohol rubs thus may decrease the risk of cross-contamination, or use of new chart covers may be cost effective.

It is also recommended that health care workers should wash their hands also after attending the patient and before entering the case notes in the patient's file.

Alcohol-based hand rub, a very cost effective means of NI control, also has repeatedly been shown to help improve compliance with hand hygiene and reduce transmission of pathogens after reviewing the patients' chart. Therefore, as an immediate consequence of this study, our staff members have been instructed and encouraged to observe hand hygiene with alcohol-rubs, before next patient contact and the surveillance on handling and random testing of the patients' charts at microbiology laboratory is ongoing.

ORIGINAL ARTICLE

Orientation and education on HW after chart handling has become a conscious routine of hospital infection surveillance system, in our hospital.

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**Table-1- Comparison of contamination of patients'charts
(n=60)**

1)Charts with pathogenic isolates	n(%)
1 isolate/chart	04(06.66)
2 isolates/chart	07(11.66)
2)Charts with CNS alone	21(35.00)
3)Charts with environmental bacteria	24(40.00)
Total isolates	63
Charts without isolates	04(06.66)
Charts with contamination	56(93.33)

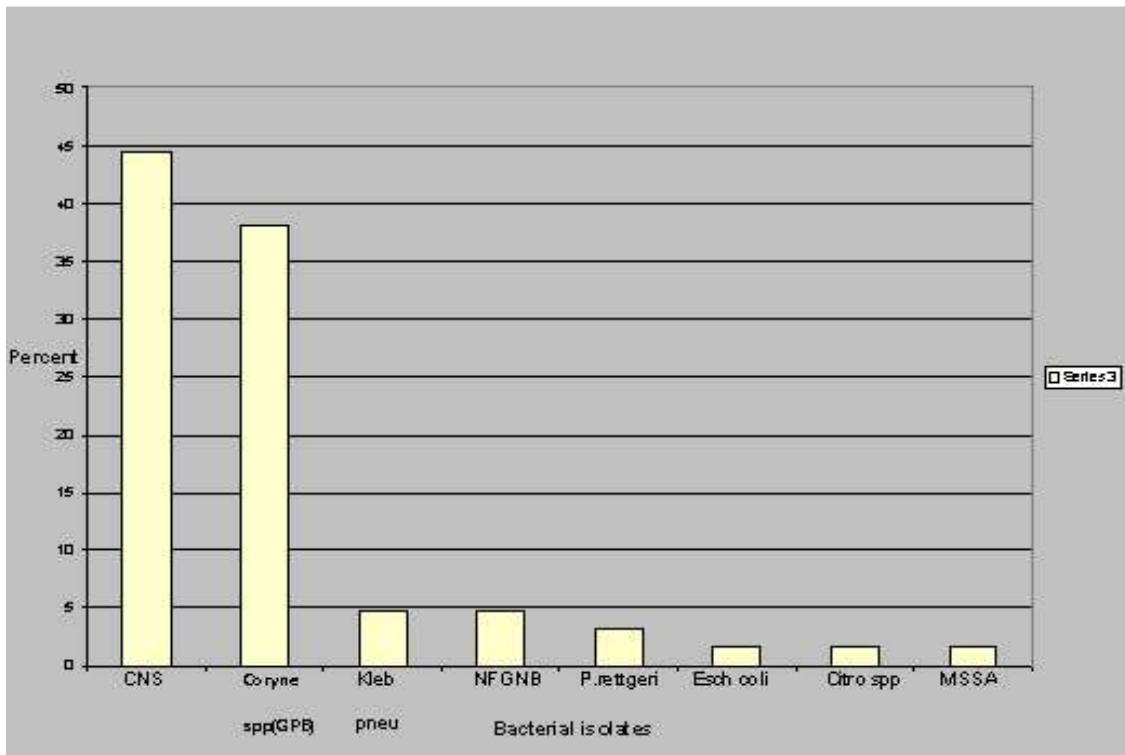
ORIGINAL ARTICLE

Table-2-Bacteria isolated from patient's charts from different areas of the hospital

	ICUs (n=3)			Surgical wards (n=3)			Other wards (n=6)
	NSICU	NMICU	EICU	MSW	FSW	PNSW	
Kleb pneu						1	2
NFGNB							3
Prov rett			1				1
Esch coli			1				
Citro spp							1
CNS	3	1	3	3	-	3	15
MSSA							1
Coryne spp	1	3	2	2	5	1	10
Total	4	4	7	5	5	5	33

Neuro medical ICU(NMICU), Neuro surgical ICU (NSICU),Emergency ICU (EICU), Neuro male surgery ward (MSW), Neuro female surgery ward (FSW), Paedatric neuro surgical ward (PNSW);Stroke ward, Neuro male medical ward, Neuro female medical ward, Head injury ward, Recovery ward, and Neuro rehabilitation ward(Other wards).

Figure-1-Percent of bacterial isolates from patients' charts (n=60)



EFFICACY OF PROPOFOL AND MIDAZOLAM IN CONSCIOUS SEDATION FOR IMPLANT AND PERIODONTAL SURGERY

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ABSTRACT: A procedure which calms the patient with good control on psychomotor response will help the surgeons to perform surgery with perfection. One such procedure is the chair side sedation. **OBJECTIVE:** Evaluation of sedation technique which involved titrating intravenous midazolam to an ideal sedation end point, followed by continuous infusion of propofol. This technique might be satisfactory alternative to general anaesthesia for implant surgery in anxious patients or when procedure exceeds 60 mins duration. **MATERIAL AND METHOD:** The study was conducted on 20 patients. Initially 2 mg bolus of midazolam was given then 1 mg dose of the same drug was given every 30 seconds until the patients was adequately sedated. 10 minutes after the induction of sedation with midazolam a continuous infusion of propofol was started at the rate of 0-200 mg per hour .The quality of sedation was assessed using Ellis and Sedation scores. **RESULT:** Total midazolam dosage for adequate initial sedation of patient was between 6 – 14 mg in 21 out of 23 treatment session. The initial propofol infusion rate was 200 mg per hour in most of the cases. **CONCLUSION:** The sedation technique describe takes advantage of the differing pharmacokinetics properties of midazolam and propofol initial sedation was achieved using midazolam which was maintained throughout the surgeries variable propofol infusion .

KEYWORDS: Conscious sedation, midazolam, propofol

INTRODUCTION: In day to day oral and maxillofacial surgical outpatient procedures, the fear psychosis is unimaginable due to anxiety towards surgery and local anaesthesia administration. There will be considerable burden on time and expenditure on general anaesthesia which will increase morbidity and distress. It is highly unpleasant for the patients. Who is completely aware of the procedure.

Conscious sedation is used to depress the central nervous system in order to facilitate dental treatment; however unlike general anaesthesia the patient is able to respond to commands throughout the period of sedation. The main aim of the anaesthetist is to attain adequate level of sedation which enables dental treatment to be carried out safely with minimum level of distress to the patient. Short term recovery following intravenous sedation (within the first 60 min) is related to distribution half life of the drug while full recovery depends on elimination half life.

ORIGINAL ARTICLE

Benzodiazepines suitable for these procedures are diazepam and midazolam both drugs act by binding to receptor complex which facilitate GABA action (major inhibitory neurotransmitter in the brain). Midazolam is more potent and acts more rapidly than diazepam. Thus making it choice for producing amnesia during conscious sedation.

Midazolam is water soluble, non irritant to tissues. It has distribution half life of 6 – 30 min and elimination half life of 1 – 4 hour¹. Midazolam is metabolized in liver and its metabolite is inactive².

Benzodiazepines can cause profound respiratory depression which is not physiologically compensated³. Therefore underlying principle for administering intravenous sedation with midazolam is to titrate incremental doses of drug according to the patients response. Signs of adequate anxiolysis and sedation include general relaxation and slurred speech⁴.

Propofol is a sedative/hypnotic which also enhances GABA activity ^{5,6}and induces depression of CNS so it can be used as an alternative to benzodiazepines for intravenous sedation ⁷. Propofol has distribution half life of 2 – 4 min and elimination half life ranging from 30 – 60 min. Propofol undergoes hepatic metabolism into four inactive metabolite⁸.

Midazolam and Propofol are used synergistically because of distinct pharmacokinetic properties^{9,10,11}. The use of midazolam in combination with Propofol has also been advocated for sedation¹².

The present study explores the advantages of using a drug with very short distribution and elimination half life for maintenance of sedation. The sedation technique used involved titrating intravenous midazolam to an ideal sedation end point followed after 10 minutes by continuous infusion of Propofol, which maintained an optimum level of sedation and also resulted in prompt recovery. This study is an evaluation of existing sedation techniques in individuals undergoing routine dental treatment.

MATERIAL AND METHOD: The study was conducted on 20 healthy adult patients, 14 females and 6 males aged between 20-55 years who consented for conscious sedation. The surgery was done in the operation room, which was fully equipped with monitors including noninvasive blood pressure, heart rate, pulseoximetry, anaesthesia machine and emergency drugs .For emergency airway management kit for endotracheal intubation was available. Intravenous line was secured and each patient received glycopyrrolate 0.2 mg. For sedation 1 mg bolus of midazolam was given and 0.5 mg incremental doses of the same drug was repeated every 30 seconds till target sedation score of 3 (eye closed, respond promptly on verbal command) achieved followed by continuous infusion of propofol starting at 200 mg per hour using a syringe pump. When the target sedation score (3) was achieved the surgeon was asked to give local block. Routinely the inferior dental, infraorbital and posterior maxillary nerve blocks were used according to the area being treated. If the patient moved bolus of 0.5 mg midazolam was given .All patients received lignocaine 2% with 1:200000 epinephrine. Maximum safe dose of lignocaine with adrenaline is 5-7 mg /kg.. Throughout the surgery the target sedation was achieved by regulating the propofol infusion rate. Blood pressure and pulse rate were monitored at 5 minutes interval throughout the surgery and SPO₂ was monitored continuously. Oxygen was not given routinely but if SPO₂ decreased below 90% for more than 60 seconds then oxygen via nasal mask was given. Each patient received 250-500ml of ringer lactate during the surgery. Intermittent suction was done throughout the surgery. Post operatively the pain response, and any type of discomfort due to procedure was noted. All patients were given

antibiotics and analgesics postoperatively. Patients were reviewed every 48 hrs till the day of suture removal.

The depth of sedation (Table 1) and behavioural characteristics under sedation (Table 2) were assessed using the Ellis¹³ and sedation ¹⁴scoring technique. An Ellis score of I and sedation score of 3 were the target levels. The Propofol infusion was stopped at the completion of surgery.

Sedation scoring system is given in table 1 and Ellis behavioural scoring system is given in table 2

Table 1: The sedation scoring system used to grade the depth of sedation of patients under intravenous sedation.

1. Fully awake and oriented.
2. Drowsy
3. Eyes closed, responds promptly on verbal command.
4. Eyes closed, rousable on mild physical stimulation.
5. Eyes closed, unrousable on mild physical stimulation.

Table 2:- The Ellis scoring system used to grade the behavioural characteristics of patients under intravenous sedation.

- I. No uninvited limb movement; total co-operation and no restlessness.
- II. Small amount of uninvited limb movement; still total cooperation and no restlessness
- III. More uninvited limb movement; small degree of restlessness and anxiety. Patient less co-operative; still able to perform all dental procedures.
- IV. Considerable degree of limb movement; perhaps also unhelpful head movements; co-operation poor; patient quite restless and anxious; able to perform only basic dentistry; advanced, delicate work not possible.
- V. Restlessness, anxiety and limb movements severe; impossible to perform any dentistry.

Any post operative complication like nausea, vomiting headache was recorded. The vitals such as heart rate blood pressure, oxygen saturation, respiratory rate were recorded 2 min before sedation, after the onset of sedation, 2 min after LA administration and followed by every 10 minutes interval of time i.e. 10th, 20th, 30th and 40th till the completion of surgery.

RESULTS: The 23 treatment sessions in the current investigations lasted from 60 to 150 min depending on the number of implant and nature of surgery. Total midazolam dosage for adequate initial sedation of patients was between 6– 14 mg with sedation score of 3 (table 1) in 21 out of 23 treatment sessions. The initial Propofol infusion rate was 200 mg/hr (20ml/hr). This was adjusted throughout the surgery to maintain the sedation score of 3 in 21 out of 23 treatment sessions. Sedation score of 2 (drowsy) and 4 (eyes closed but reusable on mild physical stimulation) respectively were recorded in the remaining 2 patients. The total dose of Propofol administered to the patient was between 50 mg to 350 mg. Throughout the surgery the arterial oxygen saturation was between 92 – 100% (without oxygen). All patients were fit to

discharge within 4 hours of termination of Propofol infusion. No postoperative nausea, vomiting and headache were recorded in any patients.

DISCUSSION: Anxiety and fear are inevitable circumstances met by the patients undergoing oral surgical procedures. Conscious sedation is very helpful to carry out minor oral surgical procedures. Midazolam produced 30 – 40 min of profound amnesia, anxiolysis and sedation¹⁵. Amnesia was useful in reducing the memory of administration of LA and of oral surgery which are often perceived as unpleasant by an anxious patient. The total midazolam dosage required for adequate initial sedation was 6 – 10 mg. Like our study, the variability and unpredictability of the midazolam dose required to produce sedation in patients has been previously reported^{16,17}. Factors such as anxiety, concurrent drug treatment, amount of sleep the night before operation and the level of stress encountered at work or in home are extremely variable and may explain why it is almost impossible to predict how much midazolam will be required for a particular patient¹⁸. There was tenfold variability between individuals liver content and catalytic activity of major liver enzyme involved in the metabolism of midazolam^{19,20,21} which could account for unpredictability of patient response for midazolam.

An initial Propofol infusion rate of 200mg/hr (20ml/hr) was employed for 21 of the 23 treatment sessions. Sedation score of 3 was maintained throughout the procedure satisfactorily by this dose. When propofol was used as sole agent the dose used was 300 mg per hour. There is decrease in dose requirement of propofol when used in combination with midazolam is widely reported^{11,22,23} and it is because of fast acting nature of midazolam and the synergistic interactions of Propofol and midazolam²⁴. While the use of midazolam in combination with Propofol was previously used for sedation¹², these authors used midazolam as premedication prior to a bolus dose of Propofol, followed by Propofol infusion. There is unpredictability of midazolam^{16,17} and Propofol^{25,7} when administered as bolus injections which increase the potential for both over sedation or under sedation. Our sedation technique involved titrating intravenous midazolam to an ideal sedation end point according to patient's response in order to avoid over sedation or under sedation. Taylor et al (1992) attempted to maintain a sedation score of 3 throughout the procedure¹² but fixed initial propofol infusion rate did not allow operator to adjust the sedation level. 10 minutes after the administration of midazolam 1 patient was restless (Ellis score =3) in which the initial propofol infusion rate was increased to 300 mg per hour and it was reduced after 30 minutes when the patient became more relaxed. The second patient had sedation score of 4 and Ellis score of 2 after 10 minutes of intravenous midazolam and in this case the initial propofol infusion was reduced to 50 mg per hour. Infusion rate was increased to 150 mg per hour when the sedation score was achieved to 3.

In the current investigation, the Propofol infusion rate was adjusted between 0 mg/hr (0ml/hr) and 200 mg/hr (20ml/hr) depending on the level of sedation achieved with the titrated midazolam. By titrating midazolam to the patient's needs and then varying the rate of infusion of a drug with short distribution and elimination half-life the level of sedation was optimised throughout the surgical procedure. Using the sedation and Ellis scores it was shown that the quality of sedation was satisfactory for both the patient and the operator. None of the patients had significant respiratory compromise, hypotension, bradycardia, nausea, vomiting.

CONCLUSION: The sedation technique involved giving initial sedation with midazolam, this was then maintained using a variable propofol infusion. The shorter distribution and elimination

ORIGINAL ARTICLE

half life's of the latter drug made it easier for the operator to match the level of sedation according to patient's need and also provided good short term recovery.

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THE STUDY OF ARRHYTHMIAS FOLLOWING MYOCARDIAL INFARCTION OCCURRING WITHIN ONE WEEK

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ABSTRACT: OBJECTIVES: Acute myocardial infarction continues to be a major health problem. 50% of deaths with acute myocardial infarction is said to occur within first 24 hours after myocardial infarction and is attributed to arrhythmias. Arrhythmic deaths remain the major cause of death with reduced left ventricular ejection fraction or frequent ventricular premature beats. The objective of this study is to assess various arrhythmias following myocardial infarction within one week and to study the association of these arrhythmias with left ventricular dysfunction. **METHODS:** Minimum of 100 cases diagnosed as acute myocardial infarction (European/ ACC Guidelines 2000) with arrhythmias collected by simple random sampling. Data was collected in a pre-tested proforma by meeting objectives of the study, detailed history, physical examination, ECG changes from day 1 to day 7 and whenever necessary, echocardiography to assess ejection fraction, and serum enzyme levels. **RESULTS:** Male to female ratio with 4:1, mortality was more in the group with risk factors of hypertension, smoking and diabetes. Commonest arrhythmias noticed in this study were VPBs – 23%, ST-22%, BBB -20%, SB-19%, VT -6%, and AF-4%. In 17 out of 69 patients, thrombolysis therapy developed reperfusion arrhythmias of which VPBs being commonest. In addition to commonest arrhythmias there was a significant association between VT, AF and LV dysfunction. **CONCLUSION:** The commonest arrhythmias encountered were ventricular premature beats followed by sinus tachycardia, sinus bradycardia, bundle branch block and ventricular tachycardia. SB & BBB were more common in IWMI where as ST, VPBs, AF and flutter were more common with AWM. In addition to arrhythmias, LV dysfunction added to the mortality. **KEY WORDS:** Myocardial infarction; Arrhythmias.

INTRODUCTION: There has been a substantial reduction in deaths from cardiovascular causes during the past 40-50 years, but cardiovascular disease remains the single most important cause of natural deaths in all developed countries of the world.

Deaths from arrhythmias in the setting of myocardial infarction (MI) have been one of the most frequent causes of sudden cardiac death. 60% of all deaths associated with acute myocardial infarction (AMI) occur within 1st hour and are attributable to ventricular arrhythmias, in particular ventricular fibrillation¹. Recent improvement in arrhythmia detection and treatment have had a major impact on the outcome of myocardial infarction.

ORIGINAL ARTICLE

There is good correlation between the site of infarct and type of arrhythmias. Sinus bradycardia, sinoatrial, escape rhythms, complete heart block and Wenchebach type are usually associated with inferior wall myocardial infarction. Atrial and ventricular premature beats are more often seen in anterior wall myocardial infarction.²

There is a view that the cascade leading to sudden death from arrhythmias can be predicted by certain interactions among structural and functional abnormalities and search for new tools for prediction, the refinement of the existing tools, and the initiation of well designed intervention trials are the steps that must be taken towards the more efficient prevention of premature deaths from arrhythmias.^{3,4} Hence this study is undertaken to assess the commonest types of arrhythmias following myocardial infarction within one week and relation of these arrhythmias with site of infarction. Study is also undertaken to assess the association of most commonly occurred arrhythmias with LV (Left Ventricular) dysfunction.

METHODS: All patients diagnosed of acute myocardial infarction according to a consensus document of the Joint European Society of Cardiology/ American College of Cardiology Committee for the redefinition of myocardial infarction, guideline, 2000 with arrhythmias admitted to K.R. Hospital attached to Mysore Medical College and Research Institute, Mysore during period from 1st January 2007 to 31st July 2008 were recruited for the study. Each patient gave written, informed consent to participate in the study and the study protocol was approved by the institutional review board including ethical issues.

SAMPLE SIZE: Minimum of 100 cases diagnosed as acute myocardial infarction with arrhythmias were taken for the study by simple random sampling.

INCLUSION CRITERIA: Patients diagnosed as AMI as per – A consensus document of the Joint European Society of Cardiology/ American College of Cardiology Committee for the Redefinition of Myocardial Infarction.

CRITERIA FOR ACUTE MI, EVOLVING OR RECENT MYOCARDIAL INFARCTION: Typical rise and gradual fall (troponin) or more rapid rise and fall [CK(MB)] and biochemical markers of myocardial necrosis with one of the following.

Ischemic symptoms

Development of pathological Q waves

ECG changes indicative of ischemia (ST elevation or depression)

CRITERIA FOR ESTABLISHED MI: Development of new pathologic Q waves on serial ECGs.

EXCLUSION CRITERIA: Patients with,

- (1) Previous history of documented arrhythmias
- (2) Old MI
- (3) History of MI more than one week.

Data was collected in a pre-tested proforma by meeting objectives of the study, detailed history, physical examination, thorough cardiovascular and other systemic examination and necessary investigations like ECG changes, echocardiography and serum enzyme levels. First ECG was taken immediately after admission. Patients were connected to cardiac monitor for a minimum of 48 hours and more if needed. Repeated ECGs were taken from day one to day seven whenever necessary and on occurrence of arrhythmias.

ORIGINAL ARTICLE

All patients were evaluated for risk factors like diabetes mellitus, hypercholesterolemia, hypertension and smoking. Routine investigations were restricted to the patients who really needed them. Enzyme studies were done in most of the cases. Patients were kept in the ICCU for a period of five days and more in complicated cases.

RESULTS: A total of 100 patients with male and female ratio of 4:1, with AMI were included in the study. The maximum number of patients were found in the age group of 61-70 years (35%), followed by 51-60 years (25%), 41-50 years (19%), 31-40 years (10%), 71-80 years (7%), 21-30 years (3%), and 81-90 years (1%).

In the study group, 48% of patients had history of hypertension, 38% of patients had smoking as a risk factor, 36% of patients had diabetes and 18% of patients had alcoholism as a risk factor.

The commonest symptom presented by patients was chest pain 95%, followed by exertional breathlessness in 31%, sweating in 16% of cases, vomiting in 8% of cases, 4% of cases palpitation and 2% of cases epigastric pain.

Most of patients (83%) had ST segment elevation MI of which 34% had extensive anterior wall MI, 23% had inferior wall MI, 14% had anteroseptal wall MI, 6% had inferior wall with RV extension, 3% had lateral and anterolateral wall MI each, and non-ST elevation MI patients were 17%.

The prevalence of various types of arrhythmias in acute myocardial infarction in relation to site of infarction is shown in table 1. In arrhythmias of which ventricular arrhythmias were more common, 23% of cases had ventricular premature beats (VPBs), 6% of patients had ventricular tachycardia (VT), 2% of cases had ventricular fibrillation (VF) followed by sinus tachycardia (ST) in 22% of cases, 20% of patients had bundle branch block (BBB), 19% of patients had sinus bradycardia (SB), 4% had atrial fibrillation (AF), 2% had atrial flutter, 1% had couplets and nodal ectopics each.

In total of 22 cases, 8 cases of sinus tachycardia were seen in extensive anterior wall. In total of 19 cases, 12 cases of sinus bradycardia were seen in inferior wall MI. Total out of 23 cases, 13 cases of ventricular premature beats were seen in extensive anterior wall MI. Out of 100 cases, 38 cases of arrhythmias were seen in extensive anterior wall MI.

Prevalence of arrhythmias from day 1 to day 7 was studied. According to this most of the patients presented with symptoms after 1 day or 3 days. The presence of arrhythmia was taken as on day 1 or day 3, etc. According to the study, ventricular tachycardia, ventricular fibrillation and ventricular flutter occurred within 24 hours. VPBs occurred after 24-48 hours.

Sinus tachycardia and sinus bradycardia present on the first day at presentation of patient symptoms had reverted back to normal sinus rhythm. Bundle branch block occurred from day 1 to day 4 it was usually left bundle branch block (LBBB) or right bundle branch block (RBBB). Prevalence of arrhythmias is shown in table 2.

Table 3 shows 47.6% of inferior wall myocardial infarction patients had bundle branch block, followed by 23.8% of anteroseptal wall myocardial infarction patients had blocks and 19.04% of extensive anterior wall myocardial infarction had blocks. Total of 21% patients had one or the other type of atrioventricular blocks. The most commonest type of blocks encountered was LBBB (38.09%) followed by 28.57% RBBB, 19.04% cases had complete heart block, 4.76% cases in bifascicular block, III^o AV block and II^o AV block respectively.

Mortalities in reperfusion arrhythmias occurred of which ventricular premature beats were more common and were self terminated. One patient with VF after reperfusion expired after cardioversion. Details of reperfusion arrhythmias is shown in table 4.

Chi-square test was used to assess the association of arrhythmias in relation to left ventricular dysfunction (Table 5). Most of the patients with sinus tachycardia, atrial fibrillation, ventricular tachycardia and bundle branch block had less ejection fraction (<40%), compared to patients with sinus bradycardia and VPBs (>40%). The association of arrhythmias with left ventricular dysfunction was significant in patients with atrial fibrillation and ventricular tachycardias with 'p' value of 0.018.

3 patients each with AF and VT had the least ejection fraction of 20-30%, followed by patients with bundle branch block had EF of 31-40%. Patients with VPBs and SB had near normal ejection fraction (EF) of 41-50%, followed by patients with sinus tachycardia had an EF of 40%.

DISCUSSION: The maximum incidence of acute myocardial infarction seen in this study was in the age group of 41 – 70 years (79%), of this 35% patients belong to 61 – 70 years group. Only 3% of cases were below the age of 30 years. Age incidence in this study is almost similar to the studies done by Marthin TC et al.⁵ and Kakade SV et al.⁶ where 85% patients were between 35 and 75 years old. Age incidence is probably more common because of life style, economic status and multiple risk factors and life expectancy.

Incidence of acute myocardial infarction in this study was 80% in males which was more as compared to females (20%). The study done by Kock HL et al.⁷ showed 72% male and 24% females. It is more common because of life style and more risk factors like hypertension, smoking, diabetes mellitus and alcohol.

In the present study, incidence of hypertension was 48% and incidence of smoking 38%, 36% had diabetes mellitus and 18% alcoholism. Mortality was more in the group with risk factors of hypertension, smoking and diabetes.

Sinus bradycardia was most commonly associated with inferior wall myocardial infarction. In the present study, 19 patients had sinus bradycardia, out of which 12 were of inferior wall MI. Similar observations were made by Michel Rotman et al.⁸ (10 – 30%), Philip J Podrid,⁹ where 16% to 25% patients had sinus bradycardia particularly of inferior wall MI and posterior wall MI. It was most often transient.

In the present study, no deaths occurred in patients with sinus bradycardia and IWMI which is same as in the study done by Mall RR and Sayami A.¹⁰

In the present study, sinus tachycardia was present in 22% patients and commonly associated with anterior wall MI (9% cases) compared to inferior wall MI (3% cases). It represents an appropriate physiological response to left ventricular dysfunction, congestive heart failure (CHF) or stimulation and over activity of the sympathetic nervous system. This study compares well with the study done by Philip J Podrid.⁹

Atrial fibrillation (4% cases) and atrial flutter (2% cases) were seen in extensive anterior wall MI as most commonly in those who had significantly left ventricular dysfunction and CHF, and had increased mortality not because of arrhythmia itself, but to factors associated with it, particularly LV dysfunction and shock. Study done by Philip J Podrid⁹, Galcera Thomas J et al¹¹ and Pizzetti F¹² et al showed AF and flutter was associated with increased mortality in patients with LV dysfunction.

ORIGINAL ARTICLE

Nodal ectopic was seen in 1% of cases and is similar to the study done by Galcera Thomas J et al.¹¹ with 1% cases of nodal ectopic.

20% of patients had bundle branch block. In the study done by Keith Newby et al.¹³ was 8 – 18% bundle branch block. In the present study, out of 20 cases, 8% cases seen were LBBB, 6% cases RBBB. The overall mortality rate was high compared to other patients in the present study. The study conducted by Keith Newby et al.¹³ shows high mortality.

Ventricular arrhythmias were seen in 31 cases of which VPBs in 23 cases, VT in 6 cases, VF in 2 cases. Study conducted by Julain Villacastin¹⁴ showed total incidence of VPB 12% and VT 18% and Mossimo Zoni Berisso et al.¹⁵ showed 19.7% VPBs and VT 6.8%.

In the present study, total incidence of reperfusion arrhythmias was 17 cases, out of which, VPBs in 9 cases, couplets 1 case, VF 1 case and VT 3 cases. In a study done by Mohamed Majidi et al.¹⁶ reperfusion arrhythmias in 157 patients were VF 4% VPB 10% and couplets 2%.

In our study, one patient developed VF after reperfusion expired. In another study done by Ghuran AV¹⁷ and Lokas DRC et al.¹⁸ VPBs are usually asymptomatic and their presence in the infarction period, regardless of frequency of complexity (bigeminy, trigeminy, etc.) has no relation to the mortality.

In the present study, about 60 patients showed varying ejection fraction in different types of arrhythmias. The ejection fraction found by echocardiography was least in AF and VT (20 – 30%) compared to BBB and ST (40%) and EF was better in sinus bradycardia (>40%) showing less ventricular dysfunction over transient clinical outcome. There was also a significant association of arrhythmias with left ventricular dysfunction in patients with atrial fibrillation and ventricular tachycardias. This is in accordance with study conducted by Joaguin F Pombo¹⁹ and Pfisterer M²⁰ in which 127 patients echocardiography reading shows incidence of severe ventricular arrhythmias was significantly higher with isolated right and left ventricular dysfunction compared with normal function. It was highest in VT and AF.

CONCLUSION: The commonest arrhythmias encountered were ventricular premature beats followed by sinus tachycardia, sinus bradycardia, bundle branch block and ventricular tachycardia. Most of the arrhythmias were seen in the first 48 hours. Mortality was more in the group with risk factors of hypertension, smoking and diabetes.

SB & BBB were most commonly seen in IWMI where as ST, VPBs, AF and flutter were commonly seen in AWWMI. ST, AF, flutter, VT and BBB were more commonly associated with LV dysfunction. There was a significant association of arrhythmias with LV dysfunction in patients with AF and VT. AF, BBB and flutter were associated with increased mortality in patients with LV dysfunction.

Further studies with larger sample size are needed to confirm the possible mechanisms between association of arrhythmias and LV dysfunction.

ACKNOWLEDGEMENTS: We are grateful to Dr. D. Venkatesh, Director/ Dean, Mysore Medical College and Research Institute, Mysore for facilitating the study. We are also thankful to Dr. H. Vasudeva Naik, professor and HOD, Department of Medicine, Mysore Medical College and Research Institute, Mysore for his help in conducting the study.

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Table 1 : Types of arrhythmias in relation to site of infarction

Arrhythmias	Site of infarction							Total
	Inferio	Inferio r wall + RV	Extensi ve anterio	Antero	Lateral	Antero lateral	Non - STEMI	
Ventricular premature beats	2	-	13	5	-	-	3	23
Sinus tachycardia	3	-	8	2	2	-	7	22
Bundle branch block	9	1	3	5	-	-	2	20
Sinus bradyardia	-	-	5	1	-	-	-	6
Atrial fibrillation	1	-	2	-	-	1	-	4
Atrial Flutter	-	-	1	-	-	1	-	2
Ventricular fibrillation	-	-	1	-	-	-	1	2
Couplets	-	-	1	-	-	-	-	1
Nodal ectopic	-	-	1	-	-	-	-	1
Supraventricular tachycardia	-	-	-	-	-	-	-	-

Table 2: Types of arrhythmias from day 1 to day 7

Arrhythmias	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Ventricular premature beats	-	7	7	5	1	1	2
Sinus tachycardia	7	6	6	2	1	-	-
Bundle branch block	5	6	6	3	-	-	-
Sinus bardycardia	9	9	1	-	-	-	-
Ventricular tachycardia	6	-	-	-	-	-	-
Atrial fibrillation	4	-	-	-	-	-	-
Atrial flutter	2	-	-	-	-	-	-
Ventricular fibrillation	2	-	-	-	-	-	-
Couplets	-	1	-	-	-	-	-
Nodal ectopic	-	1	-	-	-	-	-
Others	-	-	-	-	-	-	-
Total	35	30	20	10	2	1	2

Table 3: Types of blocks in relation to site of infarction

Site of infarction	Type of block						Total	
	RBBB	LBBB	Bifascicular block	Complete heart	III AV block	II AV block	No.	%
Inferior wall	2	5	-	2	-	1	10	47.6%
Anteroseptal	1	2	-	2	-	-	5	23.8%
Extensive anterior wall	2	1	1	-	1	-	4	19.04%
Inferior wall + RV extension	-	-	-	-	-	-	1	4.76%
Non - STEMI	1	-	-	-	-	-	1	4.76%
Lateral	-	-	-	-	-	-	-	-
Anterolateral	-	-	-	-	-	-	-	-
Total							21	

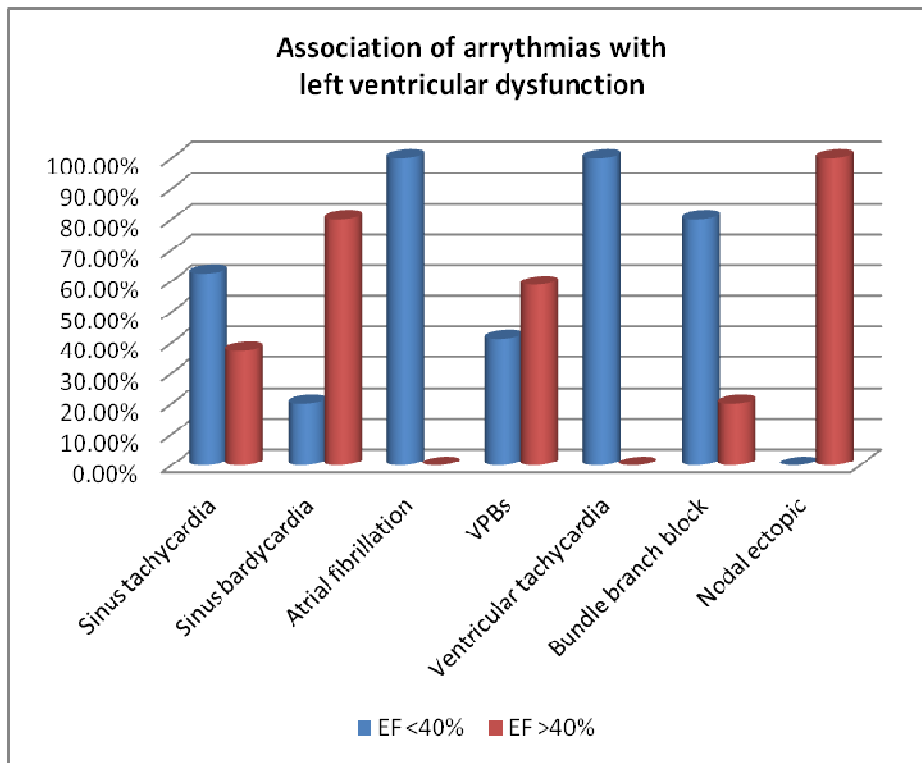
Table 4: Reperfusion Arrhythmias

Type	Number of cases	Self termination	Mortality
Occasional VPBs	7	7	-
Multiple VPBs	2	2	-
Couplets	1	-	1
Atrial flutter	1	-	1
Ventricular tachycardia	3	1	2
Ventricular bigeminy	1	1	-
Ventricular fibrillation	1	-	1
AV dissociation	1	1	-

Table 5: Association of arrhythmias with left ventricular dysfunction

Types of arrhythmias	Ejection fraction		P Value
	<40%	>40%	
Sinus tachycardia	10 (62.5%)	6 (37.5%)	0.018
Sinus bardycardia	2 (20%)	8 (80%)	
Atrial fibrillation	3 (100%)	0 (0%)	
VPBs	7 (41.2%)	10 (58.8%)	
Ventricular tachycardia	3 (100%)	0 (0%)	
Bundle branch block	8 (80%)	2 (20%)	
Nodal ectopic	0 (0%)	1 (100%)	
Total	33	27	

Chi-square value: 15.28, Degree of freedom: 6.



PERSONALISED DENTURES WITH BRANCHING TECHNIQUE

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ABSTRACT: While the basic process of making dentures has changed little over the past several decades, new materials and techniques can help laboratories and clinicians provide functional, esthetic restorations that offer exceptional value to patients.

Unlike the conventional “linear” methods which follow specific steps in a cookbook fashion, the Branching Technique is a dynamic concept which can be adjusted to meet the clinical needs of each patient. This customized technique allows for a “trial” denture to be worn by each patient that is used to pinpoint and solve the patient’s denture problems before the final denture is made. This individualized approach helps to eliminate disappointments or surprises. From the preliminary impressions and the “training” denture (it’s actually a provisional denture) to the functional impressions and porcelain teeth to hold the patient’s vertical dimension, the Branching Technique produces the most esthetically pleasing and functionally stable dentures possible.

KEY WORDS: Branching Technique, lingualized occlusion, retention, support, stability

INTRODUCTION: Complete denture prosthetics has been taught in schools the very same way since the turn of the century.¹ The denture fabrication process is one that involves more appointments than most of the procedures. Normally there are six steps to accomplish so that the patient is satisfied with their new custom dentures.

While the basic process of making dentures has changed little over the past several decades, new materials and techniques can help laboratories and clinicians provide functional, esthetic restorations that offer exceptional value to patients.² The success of complete dentures can be interpreted by the patient from two distinct view points: function and appearance.

One of the aims of prosthetic rehabilitation is to restore accurate phonation and dentofacial harmony. The incisors and canines take on a fundamental role in fulfilling these functions. Everyday each person experiences the importance of these teeth in speaking and smiling (Martone, 1963; Pound, 1977b). Prosthetic dentistry has always tried to find a method capable of establishing the correct position of the anterior teeth in an edentulous arch.³

Adopting Frank Lloyd Wright’s working philosophy that “form and function are one”, Pound advanced the concept that function in the oral environment should not exist without aesthetic form, as is often seen in dentures. An alternative technique of denture fabrication is the Branching Technique which is a very individualized and personalized approach and was originally conceived by Dr. Earl Pound approximately 3 decades ago. The Branching Technique is a dynamic concept which can be adjusted to meet the clinical needs of each patient.

REVIEW ARTICLE

PROSTHODONTIC PRINCIPLES: Three prominent prosthodontic principles are applied in the manufacture of dentures: stability, retention and support. Each principle is what helps keep dentures in the mouth, where they belong, allowing the patient to eat and speak normally again.

- Retention: Denture retention has been defined as 'resistance of a denture to vertical movement away from the tissues'⁴ and as 'that quality inherent in the prosthesis acting to resist the forces of dislodgement along the path of insertion'⁵
- Stability, the second principle describes that quality of maintaining a constant character or position in the presence of forces that threaten to disturb it; the quality of being stable; to stand or endure. It is the quality of a removable dental prosthesis to be firm, steady, or constant, to resist displacement by functional horizontal or rotational stresses⁶
- Support implies the resistance to displacement away from the basal tissue or underlying structures⁶

THE THREE TECHNIQUES: Some clinicians have found satisfaction in fabricating complete dentures by mastering the classic "five-appointment method" taught to them in dental school and modified as needed or required for specific patients.² A lot of denture wearers have difficulty in eating the foods that they want and need to eat, in speaking clearly, and with their appearance. To solve these problems, a more involved denture technique called the Branching Technique is used. The "branching technique," taught first by Pound and later by Dr. Walter "Jack" Turbyfill and others, allows for extended treatment and management of more complex patient problems.⁷ The accelerated techniques taught by Frush and Smudde allow for clinical efficiency while still managing difficult prosthodontic cases.

All three methods—the traditional five-appointment method, the branching technique and the accelerated technique—require attention to detail and the ability to efficiently fulfill patient expectations.² Ultimate success in treatment appears to be attributable to a combination of excellent esthetics, fit and skill in patient management.

THE BRANCHING TECHNIQUE: The Branching Technique is a very individualized approach to denture fabrication originally conceived by Dr. Earl Pound approximately 30 years ago. In the modern practice of complete denture prosthetics, the edentulous patient is first provided with a provisional denture.⁸⁻¹² A "training denture" is used to treat the inflamed gum tissue, establish the bite, develop the esthetics, and make an impression that perfectly fits the gums before the final denture is made. The "training denture" is a temporary denture that contains a soft, conforming material inside that is worn for several weeks while chewing food, smiling, talking etc. This provisional denture will allow the dentist to refine all of the functional aesthetic aspects of the denture to his or her and the patient's satisfaction. It basically provides a perfect blueprint for the final denture. This approach leads to patient happiness without the frustrating surprises of the past and makes the practice of denture prosthetics very predictable. While the patient wears the treatment denture, an added benefit is the creation of functional impressions. After final delivery of the denture, few, if any, post insertion adjustments are necessary.

This is not a quickie mass production technique, but designed for dentists who want the ultimate in full denture service for their patients.

HALLMARKS OF POUND TECHNIQUE: Hallmarks of the Pound technique include positioning the anterior teeth using the mandibular movements of speech, the use of linguized occlusion, and the fabrication of diagnostic provisional dentures.²

REVIEW ARTICLE

The Branching Technique properly positions teeth in naturally contoured bases that fit and function well. Anterior teeth are arranged using the patient's speech patterns and esthetic needs. Posterior teeth are arranged for efficient function with minimal interferences.

The basis for determining the most ideal occlusal schemes for removable prosthetics borrows several of the accepted ideologies and procedures commonly used to stabilize and restore natural dentition. In partially edentulous cases, it is advisable to minimize any deleterious forces from the indirect retainers on the abutment teeth.¹³ With fully edentulous cases, the lingualized occlusion recommended by Turbyfill seems to provide the most successful results.¹⁴ Lingualized occlusion involves the use of more highly angled or 'sharper' denture teeth on the maxillary denture, against lower angled or more shallow anatomy on the mandibular denture. An anatomic maxillary posterior tooth (33-degree cuspid tooth) that occludes in a lingualized fashion into the central fossae of the lower is chosen.^{11,14} The esthetics is far superior to flat plane and other lesser degree teeth. The beautiful maxillary buccal cusps look natural. The purpose of the maxillary buccal cusp is esthetics, food manipulation, and overjet to prevent jaw biting. This produces a stable and functional occlusion with no interferences to rock the dentures. Porcelain posterior teeth resist wear and maintain vertical dimension of occlusion. This simulates a "mortar-pestle" action that aids chewing efficiency, yet can potentially minimize the lateral forces that can not only dislodge the dentures, but also create more sore spots.

One predictable impression technique that establishes uniform tissue support employs the various procedures developed by Pound and expounded by Turbyfill.¹⁵ The use of a soft liner in the treatment denture can produce dramatic improvement in the condition of the tissues that support the denture. Soft liners in the treatment dentures provide comfort and a secure fit, while reconditioning abused tissues. The healthy tissue will provide for a more comfortable and retentive denture-wearing experience.

Guidelines For Anterior Teeth Positioning

Proper contour and normal physiologic movement of the muscles enhances an esthetic denture, whereas improper support can detract from it severely. Positioning the anterior teeth using the mandibular movements of speech is a hallmark of the Pound technique, a method which has proven successful over decades.^{7,16}

1. The pronunciation of the letter "M" places the upper lip at rest at completion, illustrating the amount of display of the central incisors. Men should display 1 mm to 2 mm; women 3 mm to 4 mm.
2. The use of the letters "F" and "V" illustrate the appropriate relationship of the incisal edges with the vermillion border. Ideally, the maxillary incisors brush lightly against the border during the formation of these letters.
3. The use of the letter "S" aids in the determination of appropriate vertical dimension through evaluation of the "speaking space." Both men and women should display 1 mm of clearance between the upper and lower incisors during the formation of this letter.

The mandibular anterior teeth are set using phonetics. Dawson¹⁷ noted that the vertical dimension of occlusion that has been lost can be regained by noting the closest speaking level and then establishing the vertical dimension of occlusion slightly more closed from that closest speaking position. Pound¹⁸ referred to this as the vertical dimension of speech, and since the teeth are not to touch while a person is speaking, then the vertical dimension of occlusion

REVIEW ARTICLE

should be slightly more closed than the "S" position. The "S" position is the most intimate relationship of any teeth during speech.^{19,20}

The vertical dimension of occlusion is very easy to determine since it is always less than the vertical dimension of speech.²¹⁻²³ Therefore, when the anterior teeth are set to the "S" position, the mandible is retruded and closed down 2 mm to tooth contact or, if no teeth touch, merely closes in a centric relation 2 mm less than the vertical dimension of speech.

Two mandibular incisors are set to the "S" position. Pound defined the "S" position as the most intimate relationship of the teeth during speech.¹⁸ There are intimate relationships that occur between the incisal edges of the mandibular teeth and the incisal edges and lingual surfaces of the maxillary anterior teeth. This allows the dentist to verify the accuracy of the maxillary tooth arrangement and place the mandibular incisors in an anatomically natural position that produces an articulate speech pattern.

If a significant adjustment in the vertical dimension of occlusion (VDO) is required, the denture(s) can be adjusted to establish the appropriate VDO and incisal edge position on a trial basis. The clinician can articulate the denture before the impression procedure, equilibrate through occlusal reduction, or roughen the incisal and occlusal surfaces and add provisional material.

If adjustments in tooth position are desired in the new appliances, the clinician should record the desired changes with a study cast. Final dentures completed with porcelain teeth and custom tinted resin bases can restore one's appearance and confidence.

FUNCTIONAL IMPRESSION: A functional impression is created by applying a functional impression material to the fitting surface of an existing denture. This impression technique creates an impression under functional stresses.²⁴ One functional impression material, Hydro-Cast, was developed by Dr. Earl Pounds and Mr. Clark Smith in the 1950s, and remains one of the best kept secrets in dentistry. The described technique using this material can be used when the patient's existing dentures fit reasonably well. If any borders are overextended, they can be adjusted and polished. If any borders are short, they can be corrected by the addition of Triad.

1. Preparation of the Denture Base: Prepare the denture base by removing any extreme undercuts as would be performed for a reline impression. This preparation allows the denture to be removed from the master cast without damage to the cast or denture. Also, apply petroleum jelly to the teeth to facilitate easier removal of the tacky Hydro-Cast material at completion.
2. Powder- Liquid Ratio: The material consists of a powder (fine-milled alginate) and liquid (ethanol) that are mixed at a ratio of 3:1. Mix the ingredients only enough to incorporate the components .
3. Manipulation of the Material: Allow the mixture to sit covered for a few minutes, until it reaches a manageable honey-like consistency. Then, load the material into the denture base. Border-mold the impression as normal during setting. The initial set takes 3 to 5 minutes.
4. Final Adjustment: On removal of the denture from the mouth, any premature pressure areas should be evident from the acrylic base bleed through. Adjust any premature contact areas with an acrylic carbide bur, mix and add new material, and reseal. Excess external material can be removed with a heated carving instrument.
5. Tissue Conditioning: After a satisfactory initial result, dismiss the patient with instructions to return in 4 to 5 days for evaluation of the functional result. The material

REVIEW ARTICLE

does not reach a complete set until this period, thus the functional impression is accomplished. This technique also provides for tissue conditioning. Tissue conditioning occurs when a soft material applied to the fitting surface of a denture allows for more equal distribution of load and a return of the mucosal tissue to its normal position.²⁴ Hydro-Cast is such a soft material. Tissue conditioning may need to be repeated over several visits to allow abused soft tissue to reach a satisfactory condition. Therefore, Steps 1 through 5 may need to be repeated over multiple office visits.

6. Bite Registration: On completion of the tissue conditioning and the final impression, take a bite registration, preferably with a vinyl or other static material as rubber base materials or bisacrylate formula based^{25,26}. Then, pour the master casts and articulate the dentures.
7. In cases where upper and lower complete dentures are to be fabricated, additional steps are needed to ensure proper positioning of the maxillary anterior teeth on the new denture.
8. On articulation of the dentures, remove only the lower denture from the master cast.
9. 9.Adaptation of silicon putty: Place a roll of silicone lab putty or baseplate wax on the lower cast and close the articulator, capturing the upper denture teeth in the roll. In the case of a single maxillary denture, a silicone putty matrix can be accomplished by adapting the putty to the facial surfaces of the mandibular anterior teeth and the maxillary denture teeth.
10. Developing the study cast: Capture an alginate duplicate of the existing upper denture for the development of a study cast for the technician's use.
11. Anterior Teeth Positioning: The technician can place the incisal edges of the new anterior teeth in exactly the same position as the existing denture. If any adjustments in position are desired, the technician has a very specific starting point for reference and measurement.

The denture base is important in esthetics.^{27,28} In the 1950's the American Dr. Earl Pound innovated many techniques reproduction of living tissues in dentures is also made possible by the emergence of colour for creating natural looking dentures. After the boil-out and cleaning of the flask, one can "custom" stain the gingival areas. This is a relatively easy technique to learn but takes some time to master. The flask is the packed in the conventional manner and the staining acrylic becomes part of denture. The stains are called "Kayon". This method was developed by Dr. Pound in the 50's. There are 5 different stains

DISCUSSION: Patients that present for new dentures typically have old dentures with aberrant tooth positions, lost vertical dimension, poor esthetics, discomfort and, if their old dentures have plastic posterior teeth, there are heavy occlusal forces in the anterior due to the wear of the plastic teeth. Even worse, if the patient who presents for new dentures has no old dentures or teeth, there are no reference points to start from and denture fabrication can seem even more daunting for the practitioner.

The training denture allows the dentist and the patient the opportunity to evaluate all the factors mentioned above. Prior to the fabrication of the definitive dentures, any alterations deemed necessary from the "test drive" can be made. This ensures dentures of the highest quality for the patient.

In addition, when the training dentures are fabricated from the preliminary impressions, there is relief in the intaglio surface of the denture that provides room for a

REVIEW ARTICLE

functional impression material (Hydrocast – Sultan Dental). Hydrocast is essentially a soft acrylic material that takes weeks to set and will record the differing redundancies of the various soft tissues in the mouth in function. It makes a very accurate final impression and border molds beautifully.

It has been argued that dentures with a lingualised reduced occlusal scheme may be advantageous as a lingualised occlusion is supposed to improve occlusal stability of complete dentures²⁹. Another recently conducted study showed that dentures with lingualised occlusion scheme do appear to positively influence patients ratings of satisfaction concerning the stability of a set of complete dentures as compared to a traditionally bilaterally balanced occlusion.³⁰

Certainly, the cost of fabricating a set of dentures in this manner will be greater, but there are many advantages of this technique. First, of course, is the quality of the final product for the patient. Second, the patient will have a back-up set of dentures that will fit beautifully if repairs are ever necessary to the definitive dentures.

When making tooth position changes to idealize esthetics and function, many times patients don't feel comfortable with such a dramatic change in their appearance. It sometimes takes a while for them to realize how much better they look with their lips supported or their vertical dimension opened back to where it had been previously or both. Fabricating a training denture allows the practitioner to get the patient most of the way to where he thinks the patient should be, and then additional changes can be made going from the training dentures to the definitive dentures.

Even the internal fit of the denture is functionally correct. It is made from an impression captured in action (during chewing, talking, smiling, swallowing, etc) rather than an impression that is pressed into the tissue for a few minutes while the patient is holding still. Predictability, comfort and satisfaction are finally possible. While the method of Branching Technique creates accurate final impressions and occlusal registrations, it does require a little more time and effort from the clinician and staff.¹⁶ This investment of time is returned when the patient returns for a predictable wax try-in, typically requiring little to no adjustment.

CONCLUSION: Given the use of a proven, functionally generated impression technique, extremely accurate and comfortable removable full and partial denture situations can be constructed with ease. For fully edentulous cases, the only additional requirement for success is providing a fully bilaterally balanced lingualized occlusal relationship. These are the tools that will help the treating dentist achieve predictable success, and provide the most comfortable and functional removable prosthetic alternative possible to an ever-expanding patient base.

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CASE REPORT

PERIPHERAL CALCIFYING EPITHELIAL ODONTOGENIC TUMOR –A CASE REPORT AND BRIEF REVIEW OF LITERATURE

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ABSTRACT: Calcifying Epithelial Odontogenic Tumor (CEOT) is an extremely rare, benign neoplasm, accounting for approximately 1% of all odontogenic tumors. Peripheral CEOTs commonly resemble oral hyperplastic or reactive lesions and are histologically similar to their intraosseous counterparts. We report an unusual case of peripheral CEOT. A 40-year-old female presented with firm, gingival swellings localized in premolar area of the mandibular lingual gingiva. The presumptive diagnosis was giant cell granuloma. The masses were surgically excised under local anaesthesia with bone curettage. Morphologic features, histochemical and immunohistochemical tests revealed peripheral variant of calcifying epithelial odontogenic tumor. So gingival masses must be carefully evaluated for clinical and histologic evidence of neoplasia.

KEYWORDS: Calcifying epithelial odontogenic tumor, peripheral CEOT

INTRODUCTION: Peripheral odontogenic tumours are benign uncommon focal overgrowths of the oral soft tissue, usually occurring in the gingiva and the mucosa overlying the jaw. Peripheral Calcifying Epithelial Odontogenic Tumor (CEOT) is a rare benign tumour. CEOT is a locally invasive neoplasm characterized by deposition of amyloid-like material and its calcification. Very few cases of the extraosseous are reported till now and the gender ratio of male to female is 6:5. Mean age of onset is 30 years. Clinically, the lesion appears as a painless firm gingival mass, 0.8–1.7 cm in diameter, with a normal to red colour. The surface may be ulcerated. The mandible is the most common location with a slight predilection to the anterior and premolar area. Four of the nine reported cases have exhibited the unique microscopic features of a peripheral epithelial odontogenic tumor.²⁻⁸

CASE REPORT: A 34 year old systemically healthy female patient was reported to the Oral and Maxillofacial department, complaining of an asymptomatic slow-growing swelling which gradually increased to the present size within a period of 6-month duration in the lower left anterior lingual region. The onset was spontaneous and there was no history of trauma or

CASE REPORT

functional impairment. Extraoral examination and palpation revealed cervical lymph nodes of normal size and consistency. On intraoral examination the painless, firm, sessile swelling of 3x2 cm was located in the lingual vestibular gingiva between right mandibular central incisor and left mandibular first premolar teeth, covered by a normal oral mucosa.(Fig .1)

Radiographically the lesion showed a characteristic saucerisation or cupping resorption of bone appearing as unilocular radiolucency on a IOPA film causing resorption at interdental areas and shows numerous scattered radiopaque foci of varying size and density suggesting of a peripheral lesion.^{9,10} There is slight displacement of teeth with respect to lower left lateral incisor and canine .Occlusal radiograph shows buccal displacement with respect to lower canine

(Figure 2 and fig 2.a)

A clinical differential diagnosis of Fibroma ,Peripheral ossifying fibroma and Peripheral giant cell granuloma was considered and the decision was made to excise the lesion under local anaesthesia. During the surgical procedure, the lesion was totally enucleated and the bone surface was curetted and sent for histopathological examination. On gross examination the lesion was blackish brown in colour, hard in consistency, measuring 4.2x1.5x0.5 cms in dimension.(Figure 3)

Histopathological examination showed sheets of closely packed polyhedral odontogenic epithelial cells showing hyperchromatic nuclei and eosinophilic cytoplasm with mild pleomorphism. Amyloid like material between odontogenic epithelial cells, numerous calcified structures resembling liesegang rings were also seen. A final diagnosis of Peripheral Calcifying Epithelial Odontogenic Tumor was considered.

DISCUSSION: Calcifying epithelial odontogenic tumors (CEOTs) located in the oral and maxillofacial region are well-recognized examples of odontogenic tumors that display a broad spectrum of clinical and histopathologic features. On the other hand, the extraosseous variant of CEOT is extremely rare, with only few cases being described in the literatures.

The calcifying epithelial odontogenic tumor (CEOT) was first described by Pindborg ¹¹ as a distinct entity in 1955. The eponym "Pindborg Tumor" was first introduced into the literature in 1967 to further describe this interesting and unique odontogenic tumor.¹²

The first reports of extra osseous CEOT date back to 1966 when Pindborg published two cases of gingival growth in the anterior jaw region of young patients. Since their recognition, 21 cases of these tumors have been published in the English literature. The initial consensus regarding the pathogenesis of CEOT was attributed to Pindborg in 1955. He stated that the CEOT was indeed of odontogenic origin and had been associated to unerupted teeth.

Clinically, peripheral CEOT is a slow-growing solitary painless mass. There is a slight female gender preference, with most cases occurring in middle aged women. Anatomically, a maxilla to mandible ratio of 1:2 has been reported for the peripheral types and mandibular lesions are mainly found in the premolar/molar region. In contrast, the present case occurred in the anterior region of the jaws. Peripheral CEOTs mainly appear as nonspecific sessile exophytic masses in anterior gingival tissue and can mimic a wide variety of oral lesions, including, pyogenic granuloma, peripheral giant cell lesion, peripheral ossifying fibroma, and fibrous hyperplasia. However, the etiology of these conditions is usually known and careful examination is necessary when any local irritant is defined or the lesion recurs after surgical treatment.

In the present case, a provisional diagnosis of peripheral ossifying fibroma was made. This diagnosis was based on the clinical and radiographic appearance of the mass, including

CASE REPORT

normal-appearing mucosa in contrast to the red or purple color characteristic of pyogenic granuloma and peripheral giant cell lesions, respectively. Peripheral giant cell lesions usually produce a superficial 'peripheral-cuff' radiolucency that is not observed in ossifying fibroma. On the other hand, the observation of radio-opacity in the latter has been associated with mild resorption of the crest of the ridge. As observed in the present case, Peripheral CEOT may appear as radiolucency with scattered radiopaque foci. Histologically, small amounts of mineralized material might be observed, which is a common finding in peripheral CEOT types. Over the years, the histology of CEOTs has been well documented. Ai-Ru et al. subclassified this tumor into four distinct microscopic patterns, although two or more types may be present in the same tumor. Type 1 consists of sheets, nests and masses of polyhedral epithelial cells exhibiting prominent intercellular bridges. Type 2 is characterized by a cribriform arrangement of tumor cells. Type 3 consists of scattered or densely populated tumor cells. Type 4 is characterized by small nests and cords of epithelial cells. In addition, several cellular variants such as clear cell, pigmented, Langerhans cell containing bone and cementum forming, myoepithelial cell, and noncalcifying subtypes have been reported. According to the histologic classification of Ai-Ru et al., Peripheral CEOTs can be divided into three main variants: clear cell, conventional, and hybrid. Only one case was reported by Etit et al., in which the CEOT presented unusual features of ameloblastoma.

In the present case, the slow gingival growth of the mass, small size, and clinical appearance similar to that of peripheral ossifying fibroma may lead to an incorrect clinical diagnosis and inadequate treatment. Abrahão et al. reported a unique case of bilateral peripheral CEOT presumptively diagnosed as bilateral pyogenic granuloma that was surgically excised without bone curettage and recurred bilaterally one year later. Thus, although peripheral CEOT is a nonaggressive tumor and recurrence is rare, a favorable prognosis depends on complete excision of the tumor and effective curettage. Furthermore, malignant transformation is an extremely rare phenomenon.

The clear cell odontogenic carcinoma¹³⁻¹⁵ should also be considered in the histologic differential diagnosis of the CEOT. Although this neoplasm may exhibit nests composed entirely of clear cells with a frequent deposition of calcium salts, usually in the form of Liesegang rings which is not observed commonly with the CEOT. In addition, an extraosseous clear cell odontogenic carcinoma has not yet been reported.

In summary, Pindborg tumors are uncommon odontogenic tumors and even though extremely rare peripheral CEOTs, should be included by dental surgeons in the differential diagnosis of gingival lesions.

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CASE REPORT

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Fig. 1



Fig. 2

CASE REPORT



Fig .2.a



Fig .3

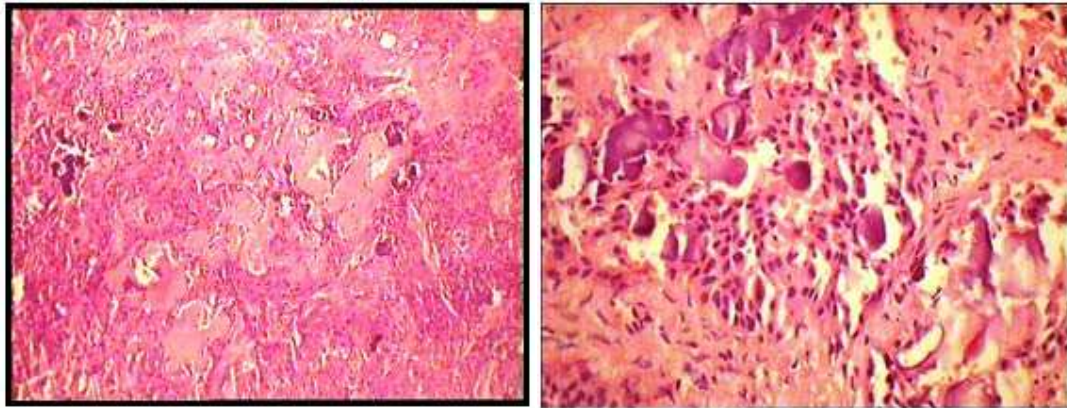


Fig .4

CASE REPORT

INTRACELLULAR AND EXTRACELLULAR CRYSTALLINE INCLUSIONS IN A CASE OF MYELOMA: A CASE REPORT

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ABSTRACT: The presence of crystalline inclusions in plasma cell myeloma is a rare phenomenon and cases have been reported with rod, needle, and rectangular shaped crystals in the bone marrow. Here, we present a case of plasma cell myeloma with intracellular crystalline eosinophilic inclusions and extracellular crystal depositions in the bone marrow. Since crystal depositions can be seen in many other clinical conditions, this case invites consideration of plasma cell myeloma in the differential diagnosis of patients with crystalline deposition in the bone marrow and in sites/organs other than the bone marrow.

KEYWORDS: Bone marrow, crystals, Myeloma, plasma cell.

INTRODUCTION: Plasma cell dyscrasias are a heterogeneous group of disorders characterised by the expansion of a single clone of immunoglobulin secreting, terminally differentiated, end-stage B cells.^[1] Many of their clinical and morphological features are the result of the production and accumulation of excessive amounts of monoclonal immunoglobulin.^[2,3] Plasma cell myeloma stems from malignant transformation of plasma cells with frequent overproduction of immunoglobulins. Its clinical presentation with intracellular and extracellular crystalline inclusions is a rare but recognized phenomenon.^[4-6] Crystalline inclusions with rod, needle, and rectangular shapes have been associated with free kappa or with IgA, IgD, IgG, and kappa light chain gammopathies.^[7-9] It has been determined that crystalline structures are of immunoglobulin origin and are found not only in plasma cells but also in other hematopoietic cells.^[8] Here, we present a case of plasma cell myeloma with intracytoplasmic crystalline inclusions and extracellular crystal deposition.

CASE PRESENTATION: The patient is a 53 year-old male who was referred to a hematologist for work-up of anemia and leukopenia. He has had a gradual and persistent decrease in his hemoglobin levels during the past few years associated with mild leukopenia. ESR was 150mm/hr. The protein level in a 24-hour urine sample was 1860 mg. Bence Jones protein was not detected in urine. Serum protein electrophoresis revealed a hypergammaglobulinemia pattern. Serial radiographs of the calvarium, cervical, thoracic, lumbar spine, as well as bilateral humeri and femora did not show lytic lesions.

CASE REPORT

Both, the bone marrow biopsy and aspirate had normocellular to hypercellular bone marrow with trilineage hematopoiesis, slightly decreased myeloid and erythroid series and an increased population of plasma cells. Megakaryocytes were present in adequate number and had an unremarkable morphology. The plasma cell population included a subset with round conspicuous nucleoli and intracytoplasmic, single or multiple eosinophilic crystalline rod shaped, rhomboid, needle shaped and rectangular structures (Fig 1). Scattered free extracellular crystals were also noted (Fig 2). There was an associated giant cell reaction. A Congo red stain to evaluate for possible amyloid deposition was negative.

DISCUSSION: Plasma cell crystalline inclusions with rod, rectangular, and needle-like shapes have been described in cases of multiple myeloma and they are believed to be due to accumulation of cytoplasmic immunoglobulins secondary to a block in the protein synthetic pathway.^[4-7] It is of note that it has been postulated that the presence of crystalline inclusions may indicate a nonprogressive clinical course of the disease.^[10]

Rectangular, rod-like and rhomboid-like crystals in the joints could be seen in cases of calcium pyrophosphate dihydrate (CPPD) crystal deposition disease or pseudogout.^[11] Colourless, refractile oxalate crystal deposition in the bone marrow interstitium occurs in oxalosis.^[12] Macrophages laden with cholesterol and cystine crystals may be identified in hyperlipidaemic states and in cystinosis respectively. ^[12] All of these appear different to the eosinophilic crystals described in the current case.

Renal parenchyma damage in patients with plasma cell myeloma is frequent and well characterized and can involve crystal depositions.^[13] The skin and subcutaneous tissue could also be a site of crystalline depositions in patients with plasma cell myeloma. ^[14]

The differential diagnosis in cases of plasma cell intracytoplasmic crystalline inclusions should also include reactive processes, since it has been shown to occur in cases of helicobacter associated gastritis.^[15] In the case presented here, a reactive process is ruled out due to the monotypic nature of the plasma cell population.

Finally, crystalline inclusions similar to those seen in plasma cell myeloma have been described in cases of granulocytic sarcoma.^[16]

The literature suggests that plasma cell myeloma and crystal deposition can occur in different sites such as joints, kidneys, skin and cornea in addition to bone marrow. The chief importance of these crystals is their morphological pointer towards the diagnosis of a clonal plasma cell proliferation.

CONCLUSIONS: The case presented here illustrates an unusual finding in a patient with plasma cell myeloma. This case and the review of similar cases presented in the literature suggest that crystals in the bone marrow and extramedullary sites such as articular spaces or renal parenchyma should raise suspicion of a plasma cell neoplasm, yet other differential diagnoses such as granulocytic sarcoma or reactive processes should also be considered.

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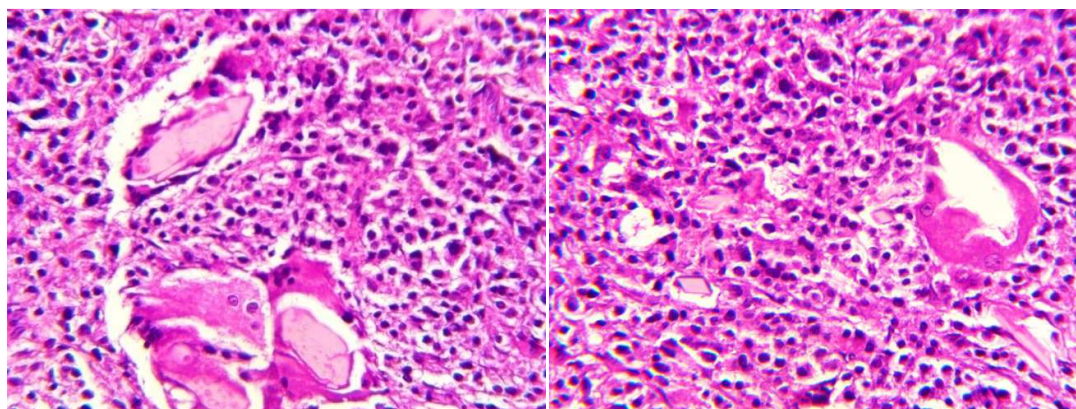


Fig 1 : " Sheets of abnormal plasma cells and crystalline inclusions. 10x. H & E

Fig 2 : Scattered free extracellular crystals. 10x. H & E

MICROALBUMINURIA IS THE EARLIEST PREDICTIVE MARKER FOR MICROVASCULAR COMPLICATIONS AND CARDIOVASCULAR RISK IN PATIENTS WITH DIABETES, A RANDOMIZED STUDY CONDUCTED IN RURAL POPULATION OF BANKURA DISTRICT, WEST BENGAL.

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ABSTRACT: Diabetic nephropathy is one of the major microvascular complications in both type1 and type2 diabetes. It is also a risk factor for development of macrovascular complications including atherosclerosis, myocardial infarction, cerebrovascular accident (CVA) and peripheral vascular diseases. A randomized study conducted on diabetic (n=40) with an age group between 40 to 70 years, where non-diabetic (n=35) was control. Fischer's unpaired "t-test" was the analytical tool for the study and which shows 24 hours urine microalbumin and creatinine as well as microalbumin/creatinine ratio in diabetic was significantly altered as compared with non-diabetic control, where the p-value is < 0.001. Altered lipid metabolism in diabetic was evaluated by measuring total cholesterol, triglyceride, LDL-C. Statistical analysis showed remarkable elevation of all above and the p-value was <0.001, and was significant. The study revealed some deleterious microvascular changes in diabetes and imposes cardiovascular risk.

KEY WORDS: Microalbuminuria, Diabetic nephropathy, Cardiovascular risk

INTRODUCTION: As per World Health Organization (WHO), at least 171 million people suffering worldwide in diabetes. Its incidence is increasing rapidly, and estimated that by the year 2030, this number will be double. Diabetes mellitus occurs throughout the world, but is more common (type II) in developed countries. The greatest increase in prevalence is, however expected to occur in Asia and Africa. The increase in incidence of diabetes in developing countries follows the trend of urbanization and lifestyle changes, perhaps most importantly a western style diet. This suggests an environmental (dietary) effect, but there is little understanding of the mechanism(s) at present, though there is much speculation, some of it most compellingly presented (1).

India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed "the diabetes capital of the world". According to the diabetes atlas 2006 published by the International Diabetes Federation, the number of people with diabetes in

India currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps taken. The so called “Asian Indian Phenotype” refers to certain unique biochemical abnormalities in Indians which include increased insulin resistance, greater abdominal adiposity *i.e.*, higher waist circumference despite lower body mass index, lower adiponectin and higher high sensitive C-reactive protein levels. This phenotype makes Asian Indians more prone to diabetes and premature coronary artery disease (12). At least a part of this is due to genetic factors; however the primary modulator of the epidemic of diabetes is the rapid epidemiological transition associated with changes in dietary patterns and decreased physical activity as evident from the higher prevalence of diabetes in the urban population. Even though the prevalence of microvascular complications of diabetes like retinopathy and nephropathy are comparatively lower in Indians, the prevalence of premature coronary artery disease is much higher in Indians compared to other ethnic group(2).In diabetes glucose is underutilized and develops clinical hyperglycemic episodes, such as ketoacidosis or hyperosmolar coma. As the disease progresses individuals are at risk for the development of specific complications including retinopathy leading to blindness, nephropathy causes renal failure and atherosclerotic heart disease(3).We have carried out the study in Department of Biochemistry in association with Department of Medicine ,B.S. Medical College & Hospital, Bankura , WB, India,

MATERIALS AND METHODS: Forty(n=40) diabetic for the study and thirty five(n=35) non diabetic for control selected randomly with the age group between 40 to 70 years, where male female ratio was 1:1.During selection of the study group, the stages of chronic kidney diseases (CKD) and cardiac functions in relation of dyslipidemia was evaluated. Occupations ,Body Mass Index (BMI),smoking habit and dietary intake was noted for individuals. The study was conducted in Department of Biochemistry in association with Department of Medicine, B.S. Medical College & Hospital, Bankura, West Bengal.

Inclusion and exclusion criteria for the selection of Diabetic and Non-Diabetic individual (study and control group)

	Inclusion criteria	Exclusion criteria
1.	Ages between 40-70 years	Pregnancy with diabetes
2.	Type I/Type II Diabetes more than ten years	
3.	Uncontrolled diabetes with or without oral hypoglycemics or insulin with monthly follow up	
4.	Impaired renal functions	
5.	Diabetes with altered cardiac profile	

The following biochemical parameters are estimated in study and control populations: 24 hours urine collected for microalbumin and creatinine estimation. Microalbumin determined by turbidimetric method (Synchron CX System)(4,6,9) and expressed in mg/24 hours urine and creatinine by alkaline picrate method and expressed in mg/dl. Fasting blood sample collected for the assay of cholesterol, triglyceride and HDL determined by enzymatic method and expressed in mg/dl. LDL cholesterol calculated by using the formula (3).

ORIGINAL ARTICLE

Statistical analysis is being done by Fischer’s unpaired “t-test”, where study group consists of forty (n=40) and thirty five (n=35) cases in control group.

RESULTS:Table-1 Different parameters and estimated Mean± SD values in Diabetic study group(n=40) and Non-Diabetic control group (n=35)

Parameters	Diabetic(Study Group)	Non-Diabetic (Control Group)
Microalbumin(mcg/24hrs urine), Mean ± SD	4888.35±326 *	164±64
Creatinine(mg/24hrs urine), Mean ± SD	38.13±2.79*	12.5±0.86
Microalbumin/Creatinine ratio (mcg/mg) Mean ± SD	142.93±17.69*	12.74±0.80
Serum Cholesterol(mg/dl), Mean ± SD	318.7±5.99*	209.7±5.21
Serum Triglyceride (mg/dl), Mean ± SD	200.95±4.42*	115.3±10.92
Serum HDL-C l(mg/dl), Mean ± SD	55.15±0.93*	76.9±1.93
Serum LDL-C (mg/dl), Mean ± SD	223.36±5.49*	110.04±5.28

*p value < 0.001

Figure-1 Diagram represents microalbumin (mcg/24hours of urine) level in diabetic (study) and non-diabetic (control) group.

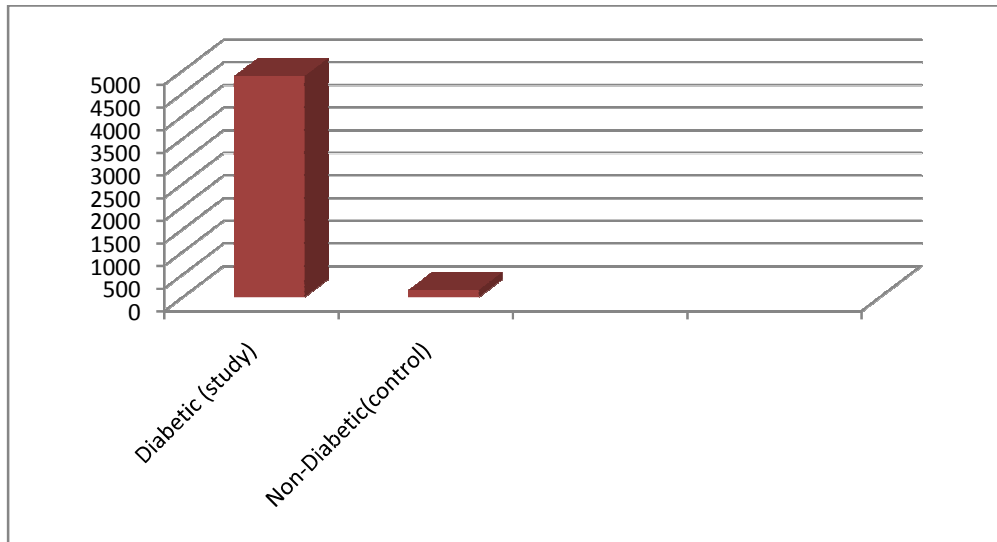


Figure-2 Diagram represents creatinine (mg/24hours of urine) level in diabetic (study) and non-diabetic (control) group.

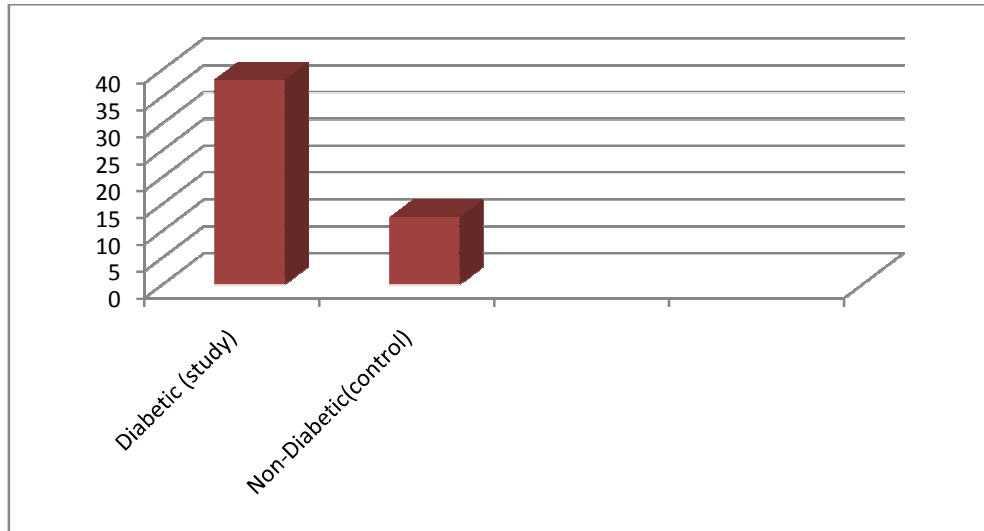


Figure-3 Diagram represents Microalbumin/creatinine ratio (mcg/mg) level in diabetic (study) and non-diabetic (control) group.

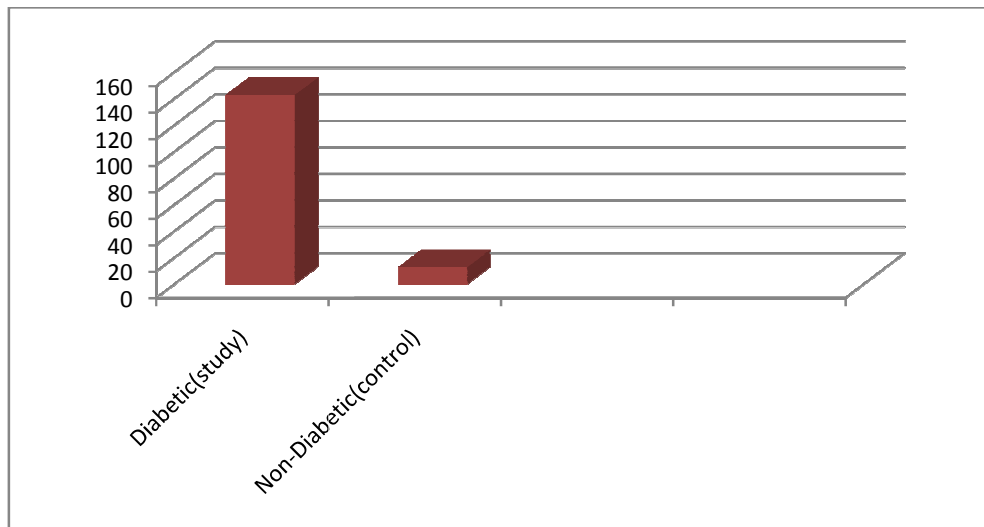


Figure-4 Diagram represents serum Cholesterol (mg/dl) level in diabetic (study) and non-diabetic (control) group.

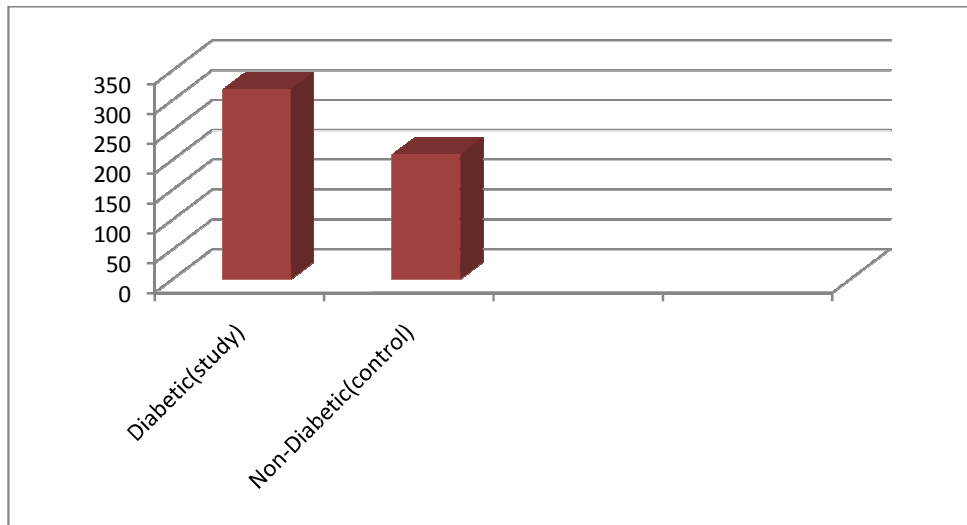


Figure-5 Diagram represents serum Triglyceride (mg/dl) level in diabetic (study) and non-diabetic (control) group.

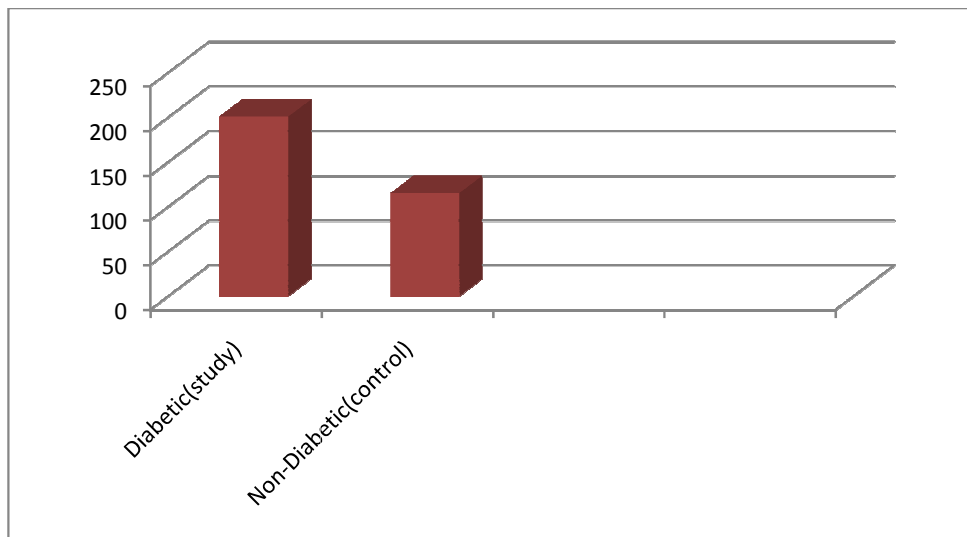


Figure-6. Diagram represents serum HDL-C (mg/dl) level in diabetic (study) and non-diabetic (control) group.

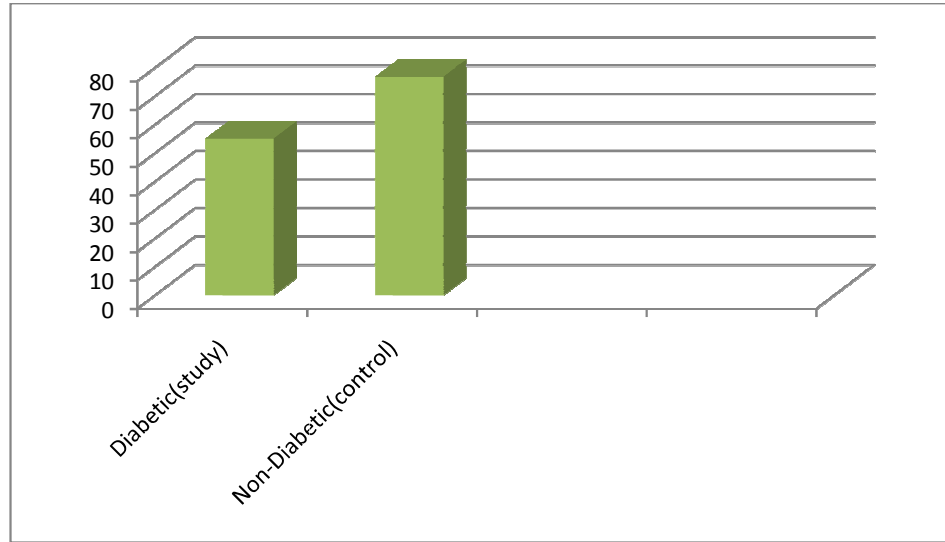
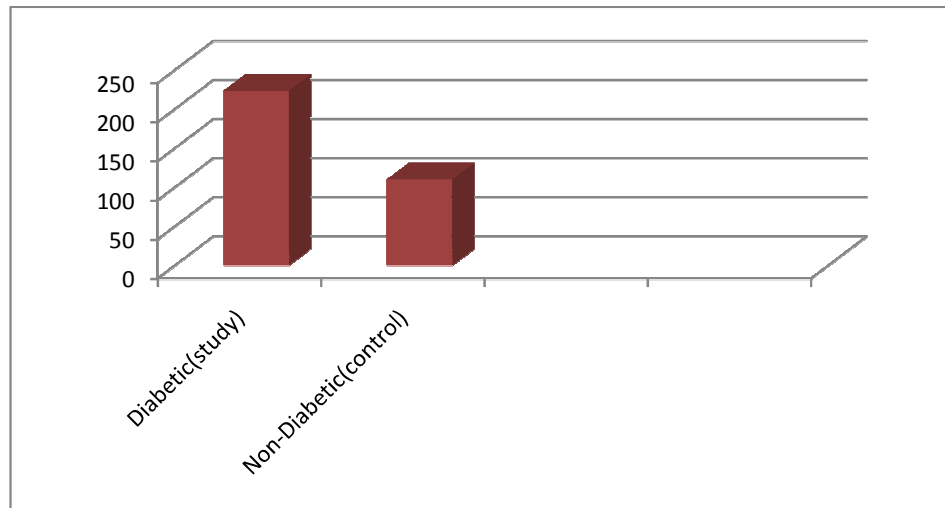


Figure-7 Diagram represents serum LDL-C (mg/dl) level in diabetic (study) and non-diabetic (control) group.



DISCUSSION: Diabetes is the most frequently found diseases worldwide and the presence of microalbumin in 24 hours urine is significant because it makes an indication towards diabetic nephropathy and this will eventually lead to end stage renal diseases (ESRD)(5,4).The pathophysiological changes are identical in type1 and type2 diabetes. The main changes glomeruli, rarely in renal tubules (6).

In our study it has been established that 24 hours microalbumin level in urine in diabetic is higher than control.Table-1 shows the mean of microalbumin in 24 hours urine in diabetic is higher than control group. The results obtained was compared by Fisher's unpaired

“t-test” where computed t-value(3.91) is greater than the critical t-value(3.56).Microalbumin level in 24 hours urine in diabetic is significantly higher than control groups where the p-value was <0.001. In our study the prevalence of microalbuminuria is 32.3%.The prevalence of microalbuminuria in male is 37.5% and in female 62.5%.The microalbuminuric patients are older and had a longer duration of diabetes compared with non-albuminuric patients(7).Figure-1 represents the significant elevation of 24 hours urine microalbumin in diabetic compared with non-diabetic. The rise of 24 hours urine microalbumin in diabetic suggests structural damage of glomerulus with or without pathological alteration of renal tubules.(8).

The serum creatinine in diabetic is raised significantly as compared with non-diabetic, where computed t-value (7.01) is greater than the critical t-value(2.02).High creatinine level in diabetic is due to extensive muscle damage (9) and figure-2 represents the moderate increase of serum creatinine in diabetic study group. Microalbumin/creatinine ratio is also grossly altered in diabetic study group as compared with non-diabetic control, where p-value was <0.001 and this is significant (table-3).High ratio of microalbumin and creatinine is due to more excretion of microalbumin in diabetic study group (10).

In our study, triglycerides, total cholesterol and LDL-C are significantly higher in diabetic subjects compared with non-diabetic individuals. In diabetes mellitus (Figure-5,4,7),the peripheral utilization of sugar is impaired following low plasma and tissue concentration of insulin(11) as a result there is increased lipolysis and decreased re-esterification takes place ,which increases plasma free fatty acids. The activity of lipoprotein lipase is low in diabetic subjects, consequently the plasma level of VLDL,LDL-C, triglycerides are increased(3,4).The HDL-C in diabetic study group is decreased significantly(Table-6) as compared with non-diabetic control and the p-value was <0.001.

CONCLUSION: The major microvascular complications in both type1 and type2 diabetes is Diabetic nephropathy and microalbuminuria is the earliest clinical marker. It is also a risk factor for development of macrovascular complications including atherosclerosis, myocardial infarction, cerebrovascular accident (CVA) and peripheral vascular diseases. Estimation of microalbumin at regular interval in known diabetic optimizes blood glucose control and management of dyslipidaemia and can slow the progression of nephropathy to end stage renal diseases (ESRD).Further study on more number of diabetic individual may explore a new dimension of knowledge, and is necessary to stabilize the deleterious microvascular changes to elongate life span.

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CASE REPORT

AESTHETIC MANAGEMENT OF FRACTURED ENDODONTICALLY TREATED TOOTH- CASE REPORT

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ABSTRACT: Title – Aesthetic management of fractured endodontically treated teeth- Case report Healthy oral cavity is primary requisite for beautiful looks. Aesthetic requirement of severely mutilated teeth has been a challenge to dentist. This paper presents endodontic treatment of grossly decayed tooth followed by the placement of a fibre-reinforced composite resin post. The crown reconstruction was done with full ceramic crown. Resin fibre post has best properties in elasticity, translucency, adaptability and resistance to traction.

KEYWORDS: Aesthetic restoration, Post and core, Fibre resin post.

INTRODUCTION: Endodontically treated teeth are more prone to fractures than the vital teeth. Fracture occurrence is more in posterior teeth than anterior teeth as the masticatory forces are higher and teeth are weaker¹. In cases where the teeth are severely decayed, endodontic treatment and placement of intracanal post or retainers become necessary before crown restoration. Posts maybe constructed of various materials including resins, composites, metals and biologic materials². Recent years various types of fibre reinforcement have come into wide spread use as an alternative to cast or prefabricated metal posts in a restoration of endodontically treated teeth³. The advantages of using fibre post to construct an intracanal post include resin composite crown reinforcement, translucency, and relative ease of manipulation⁴. A post and core is a dental restoration used to sufficiently build up tooth structure for further restoration with a crown when there is not enough tooth structure to properly retain the crown due to loss of tooth structure to either decay or fracture. An anchor placed in the tooth root following a root canal to strengthen the tooth and help hold a crown in place ⁵.

CASE REPORT: A male patient aged 48 years reported to the Department of Conservative and Endodontics with fractured mandibular left first premolar tooth for which root canal was done one year back without post endodontic restoration. The treatment plan was divided into two steps;

Step 1:- Clinical Examination:

CASE REPORT

Crown fracture was seen with 34(Fig1). IOPA were taken in relation to 34. On radiographic examination the obturation was found to be intact and as the tooth was asymptomatic.

Step 2:- Construction of Restoration

On the basis of clinical and radiographic findings following treatment plan was made, restoration of the tooth with pre fabricated post, core build up and a porcelain jacket crown. For Post space preparation 4mm of guttapercha was removed from the pulp chamber using a thin straight fissure bur. Post space was prepared with size no.2 piezo reamer supplied by manufacturer. FRC post of sizes number 2 with its diameter 1.06 was selected. The prepared space was cleaned with normal saline, air dried and bond non rinse conditioner was applied with help of an applicator tip for 20 seconds. After that two drops of each bond adhesive A and adhesive B (TANEX- fibre trans esthetic post system, Coltene Whaledent) were mixed in dispenser with help of applicator tip. It was uniformly applied in the prepared post space. It was then light cured for 20 seconds. Dual cure flowable composite resin cement (Para Core, Coltene Whaledent) was inserted into the post space after which the fibre post was inserted (Fig2). The fibre post and composite were cured together for 60 seconds. The excess coronal portion of the fibre post was cut with the help of a diamond bur. Final finishing and polishing was done with finishing burs and crown preparation for porcelain jacket crown was done. The crown was finally cemented with tooth using GIC luting cement (Fig3).

DISCUSSION: Teeth that have been endodontically treated often have little coronal tooth tissue remaining and as such require a post to retain the core and restoration. It was thought that the dentin in endodontically treated was more brittle because of water loss⁶ and loss of collagen cross linking⁷. Huang et al.⁸ compared the physical and mechanical properties of dentin specimens from teeth with and without endodontic treatment at different levels of hydration. They concluded that neither dehydration nor endodontic treatment caused degradation of the physical or mechanical properties of dentin. These and other studies support the interpretation that it is the loss of structural integrity associate with access preparation, that lead to a higher occurrence of fractures in endodontically treated teeth compared with “vital” teeth⁹. Access preparation results in increased cuspal deflection during function¹⁰ and increase the possibility of cusp fracture and micro leakage at the margins of restoration. Currently composite resin is most popular core material and has characteristics of an ideal buildup material. It has high tensile strength and the tooth can be prepared for a crown immediately after polymerization. Some authors showed that composite cores have fracture resistance comparable to amalgam and cast posts and cores¹¹. It is tooth colored and can be used under translucent restorations without affecting the esthetic results.

CONCLUSION: Aesthetic requirement of severely mutilated teeth has always been a challenge for a dentist. If certain basic principles are followed in restoration of endodontically treated teeth, it is possible to achieve high levels of clinical success with. Therefore, restoration of teeth after endodontic treatment is becoming an integral part of restorative dentistry. The treatment described in case report is simple and effective and represents a promising alternative for rehabilitation of grossly destructed or fractured teeth.

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Figure 1: Crown fracture of 34,

CASE REPORT



Figure 2: Fibre post and composite were cured,



Figure 3: Porcelain jacket crown cemented on 34

“CLINICAL AND BIOCHEMICAL SPECTRUM OF CHRONIC KIDNEY DISEASE IN TERTIARY CARE CENTER”

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ABSTRACT:BACKGROUND OF THE STUDY :The chronic kidney disease (CKD) is a known end result of type2 Diabetes mellitus and hypertension in recent times. It is associated with many features like hyperkalemia,hypocalcemia,hyponatremia,anaemia, hypoalbuminemia,multidrug resistant high blood pressure etc.So if we detect all these features early,we can extend the quality life of CKD patients. **OBJECTIVES:** The present study is undertaken with the following objective, to assess the clinical profile , biochemical profile and to determine the aetiology of chronic kidney disease, wherever possible at the time of presentation. **MATERIALS AND METHODS:** This is a descriptive study in which 50 patients with chronic kidney disease (CKD) ,who admitted at Chigateri General Hospital and Bapuji Hospital, attached to J.J.M. Medical College, Davangere, between year 2009 to 2011 were included.They were all fulfilled the criteria set by the National Kidney Foundations, Kidney Disease outcome quality initiative for diagnosing CKD by subjecting them to clinical assessment, laboratory analysis and ultrasonography of the abdomen and pelvis.The descriptives were reported based on frequencies and percentages (statistical method). **RESULTS:** The aetiology of CRF in our patients were found to be diabetic nephropathy in 38%, hypertensive nephropathy in 28%, chronic glomerulonephritis in 24%, obstructive uropathy in 6%, polycystic kidney disease in 2% and chronic pyelonephritis in 2%. The abnormality in the laboratory profile of the patients were found to be anaemia in 90%, hypocalcemia in 46%, hypoalbuminaemia in 34%, pedal edema in 78% and oliguria in 76%. The commonest clinical signs were high blood pressure in 92% and pallor in 90% of patients. **CONCLUSIONS:** The following conclusions can be drawn by our study,

1. The major symptoms were swelling of feet,oliguria and breathlessness, the major signs were pallor and persistent high blood pressure.
2. The major causes of CKD in descending order were, type2 diabetes mellitus,hypertension,chronic glomerulonephritis,and obstructive uropathy.
3. The lab features which commonly seen in our study were hypocalcemia, hyponatremia , hyperkalemia, anaemia and hypoalbuminemia in significant number of patients.

All the above features needs prompt detection and correction to prevent early mortality.

KEYWORDS : Chronic kidney disease; Chronic glomerulonephritis; Serum creatinine, Diabetes mellitus; Hypertension;

INTRODUCTION: Chronic kidney disease is characterized by a decrease in glomerular filtration rate and histological evidence of reduction in nephron population. The clinical course is typically one of a progressive and unrelenting loss of nephron function ultimately leading to end stage renal disease. There are multiple causes of kidney injury that lead to the final common pathway of End stage renal disease (ESRD), and this syndrome is characterized by hypertension, anemia, renal bone disease, nutritional impairment, neuropathy, impaired quality of life, and reduced life expectancy. Early stages of CKD can be detected through laboratory testing only. 1,2 The CKD is a known end result of type2 diabetes mellitus and hypertension in recent times, it is associated with many features like hyperkalemia, hypocalcemia, hyponatremia, anaemia, hypoalbuminemia etc. So if we detect all these features early, we can extend the quality life of CKD patients by timely interventions. 1,2,3.

The CKD is defined as kidney damage for \geq 3 months, as shown by structural or functional abnormalities of the kidney, with or without decreased GFR, manifest by either pathological abnormalities or by markers of kidney damage, including abnormalities in the composition of the blood, urine, or in imaging tests and also defined by GFR < 60 ml/min/1.73 m² for \geq 3 months, with or without kidney damage.

The GFR is considered as the best measure of overall kidney function. A GFR below 60 mL/min/1.73m² represents loss of one half or more of the adult level of normal kidney function. Normal GFR varies according to patient's age, sex, and body size. Recommended equations for estimation of GFR using serum creatinine (plasma creatinine), Age, Sex, Race and Body weight.

1) Cockcroft - Gault formula⁵

Estimated creatinine clearance

$$\frac{((140 - \text{age}) \times \text{body weight in kg})}{(72 \times \text{plasma creatinine})}$$

(multiply by 0.85 for women).

2) MDRD formula (Modification of diet in renal disease study)⁵

Estimated GFR (ml/min per 1.73 m²).

$$= 1.86 \times (\text{plasma creatinine})^{-1.154} \times (\text{age})^{-0.203}$$

Multiply by 0.742 for women

Multiply by 1.21 for African Americans.

AGE AND GENDER DIFFERENCES : AGE: In young adults, the normal GFR is approximately 120 to 130 mL /minute / 1.73 m² and declines with age.⁶ A decreased GFR in an elderly patient appears to be an independent predictor of adverse outcomes such as mortality and cardiovascular disease^{7,8}.

ORIGINAL ARTICLE

GENDER: Male gender has been recognized as an important factor in the development of CKD. In India studies have shown that upto 0.8% of the population may suffer from chronic kidney disease thereby putting the number at about 8 million of the 1 billion population.²

OBJECTIVES: The present study is undertaken with the following objectives:

To assess the clinical profile, biochemical profile of patients with chronic kidney disease at the time of presentation and to determine the aetiology of chronic kidney disease wherever possible.

METHODOLOGY: Source of data : This is a descriptive study in which CKD patients, who admitted at Chigateri General Hospital and Bapuji Hospital, attached to J.J.M. Medical College, Davanagere between year 2009 to 2011 were taken as study sample.

METHOD OF COLLECTION OF DATA : The fifty patients of both male and female with CKD, who were admitted as in patients and out patients were included, according to inclusion criteria set by National Kidney Foundation, Kidney Disease Outcome Quality Initiative for diagnosing CKD.⁴

INCLUSION CRITERIA :

A. Patients with serum creatinine above 2mg% with abnormal findings on renal ultrasound, asymmetric kidney size, small kidneys (less than 9cm), large polycystic kidneys and also normal sized kidneys especially in diabetes and amyloidosis were taken.

B. Elevated serum creatinine with no improvement for more than 3 months were also included.

Exclusion criteria :

Patients below the age of 17 years, CKD with heart failure, malignancy, liver disorders, hyperuricemia, on drugs like antimetabolites were not included in this study.

A detailed history and thorough physical examination were carried out in all patients. Data recorded on each patient by including age, sex, the underlying primary renal disease, clinical and biochemical features of chronic renal failure on a standard proforma.

STATISTICAL METHODOLOGY: The descriptives (frequencies along with the percentages) were reported. The comparison between parameters based on Serum Creatinine levels, in terms of haemoglobin, potassium, calcium and albumin levels were done by using ANOVA. (TABLE. 5)

RESULTS: In our study the mean age was 49.3 years, the youngest patient was 17 years and the oldest was 80 years of age (table 1). The causes of CKD includes, 38% patients had diabetic nephropathy, 28% had hypertensive nephropathy, 24% were having chronic glomerulonephritis and 6% were having obstructive uropathy (table 2).

The 84% of the patients had their haemoglobin level in the range of 5-10 gm%, the 6% of patients had the value below 5gm%, and 10% of patients had their haemoglobin level more than 10gm% (table 3). The 62% of patients had their blood urea level in the range 101-150 mg/dl, only 12% of patients had their urea level more than 200 mg/dl and hardly 2% had the value below 50 mg/dl. In 62% of patients the Serum Creatinine value was in the range of 5.1-12 mg/dl, 2% of patients had their value greater than 12.1 mg/dl and 36% of patients exhibit

their serum Creatinine value in the range of 2-5 mg/dl(table4).The 34% of patients had hyperkalemia and 62% had their value within normal limits (3.5-5 mEq/l). Only 4% had the value less than 3.5 mEq/l.

The hyponatremia (Serum sodium level < 130 mEq/L) was present in 24% of patients. Further in 74% cases this value lies between the normal limits (130-145 mEq/L)and only 2% had the value > 145 mEq/L. The hypocalcaemia (<8 mg/dl) was seen in 46% of cases, 52% of cases have this value within normal limits (8-10 mg/dl). The hypoalbuminemia (Serum Albumin < 3.5g/dl) was seen in 34% of cases, 66% of cases have this value within normal limits (3.5 - 5 g/dl).The total 64% of the cases seen to have decreased kidney size and 6% had an increased kidney size, where as 30% of the patients have exhibited normal size.

The clinical examination reflects that almost 90 % of the patients had pallor, 92% had hypertension , 78% had pedal edema,24% of had ascites and all the other signs were found to be below 6%(graph1). The most common symptoms found were Oliguria in 76%, anorexia in 32%. generalised weakness in 26% , vomiting in 46%,facial oedema in 22% and breathlessness in 68% of patients(graph2).Based on serum creatinine level we have compared the values of Hb%(P value-0.14),serum potassium(P value-0.18) and serum calcium(P value-0.58) among patients,which was statistically not significant.

DISCUSSIONS: The present study consists of 50 patients of CKD, who were admitted to the hospital or were on regular dialysis on OPD basis. These patients fulfilled the criteria set by the National Kidney Foundations , Kidney Disease Outcome Quality Initiative for diagnosing CKD. They were studied and evaluated by clinical and laboratory investigation including ultrasonography of abdomen .

The mean age was 49.3 years, the youngest patient was 17 years and the oldest was 80 years of age.. Our studies showed that the prevalence of chronic kidney damage as a result of hypertension and diabetes is far lower in younger age groups than in adult patients above the age of 30 years. Our findings were similar to those reported by the National Kidney Foundations KVDOQI subgroup on children and adolescents study conducted by Fivush et al 10.

In our study an increasingly high number of patients were found to be diabetic(38%) and hypertensive(28%). This trend is similar to that reported by Dash and Agarwal in the study conducted at the All India Institute of Medical Sciences¹¹.Lysaght et al have also demonstrated similar trends in American populations¹². In the study conducted by Xue et al the number of patients with diabetic nephropathy were almost 50% of the study groups¹³. The Chronic glomerulonephritis was seen in 23% patients, which is concurrent with the data of other developing countries like Egypt and Bolivia.^{14,15}

The haemoglobin levels were below 10 gm/dl in 90% of the patients.The McGonigle and Wallin et al studied 863 patients for anaemia and found upto 90% of patients to have haemoglobin less, than 10 gm/dl¹⁶. Our study showed that patients with creatinine levels above 12 mg/dl had an average haemoglobin of less than 5gm/dl, emphasizing again that greater the kidney damage, more the severity of the anaemia.

The hyperkalemia was found in 34% of patients and which is responsible for sudden cardiac death due to rhythm disturbances. As per.the study conducted by Lisa. M Einhorn et al on the frequency of hyperkalemia and its significance in CKD, the hyperkalemia increases the odds of mortality within 1 day of presentation.¹⁷The hyponatremia was reported in 24%patients in our study, which is a known association with CKD. Study conducted by Sushrut

S and Waiker et al showed that even mild hyponatremia is associated with increased risk of mortality in CKD patients¹⁸. The hypocalcemia is a known entity in patients with CRF and our study showed the prevalence of 46%. In another study on CKD patients by Coen et al found that, with the creatinine clearance of 20 to 59 ml/min, 87% of patients had abnormal bone histology and the majority had lesions of high bone formation rate associated with hyperparathyroidism¹⁹.

The kidney size was decreased in 64% of the patients. The normal sized kidneys were seen in 30% of the patients, which is attributable to the large number of diabetic nephropathy cases in which normal kidney size is a known entity. The serum Albumin levels were decreased in 34% of the patients and which is consistent with the study done by Kopple et al.²⁰ The most common symptoms in our patients were pedal oedema (78%), oliguria (76%), breathlessness (68%), vomiting (44%) and anorexia (32%). CNS symptoms like convulsion and altered sensorium were found in 4% and 10% of patients respectively. The most common signs were high blood pressure (92%) and pallor (90%). Pedal oedema (78%) and ascites (24%). National Kidney Foundations K/DOQI evaluated 26 studies which related blood pressure to the level of GFR decline in univariate and/or multivariate analysis. In another study conducted by Yuichiro Yano et al on the association between prehypertension and CKD showed that, the prevalence of CKD increased with the severely raised blood pressure.²¹ The comparison of parameters like Hb%, potassium and calcium based on serum creatinine level was not statistically significant, which indicates that irrespective of serum creatinine level clinical manifestations will be the same.

CONCLUSIONS: The following conclusions can be drawn by our study,

1. The major symptoms were swelling of feet, facial puffiness, oliguria and breathlessness, the major signs were pallor and persistent high blood pressure. So if any patient presents with these features, they need to be evaluated thoroughly to detect renal disease as early as possible.
2. The major causes of CKD in descending order were, type 2 diabetes mellitus, hypertension, chronic glomerulonephritis and obstructive uropathy. So if we detect and treat these conditions early, we can prevent further progression and irreversible damage to the kidney.
3. The lab features which commonly seen in our study were Hypocalcemia, Hyponatremia, Hyperkalemia, anaemia and hypoalbuminemia in significant number of patients. So early detection and correction of all these features needed to prevent mortality.

LIMITATIONS OF STUDY:

1. The study population is less, so it needs to be correlated with large number of population included study.

2. The renal biopsy is required for exact correlation with clinical features, for treatment and to know the prognosis of the patients.

ACKNOWLEDGEMENTS: Our sincere thanks to all teachers and authors for helping to bring out this study successfully.

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Table 1 Age and Sex Incidence

	Male	Female	Total
Number of patients	34	16	50
Mean Age	50.9 yrs	46.1 yrs	49.3 yrs
Youngest Patient	17 yrs	23 yrs	-
Eldest Patient	80 yrs	70 yrs	-

Note : Male Female ratio : 2.12 : 1

Table 2 Aetiology of Chronic Kidney Disease

Aetiology	No.of pateints	Percentage
Chronic glomerulonephritis	12	24
Diabetic nephropathy	19	38
Hypertensive nephropathy	14	28
Obstructive uropathy	3	6
Polycystic disease of kidney	1	2
Chronic pyelonephritis	1	2
Total	50	100

Table 3: Haemoglobin levels in chronic Kidney Disease

Haemoglobin (gm%)	No.of pateints	Percentage
<5	3	6
5-10	42	84
>10.1	5	10
Total	50	100

Table 4 : Serum Creatinine Values in Chronic Kidney Disease

Serum creatinine (mg/dl)	No.of pateints	Percentage
2-5	18	36
5.1-12	31	62
>12.1	1	2
Total	50	100

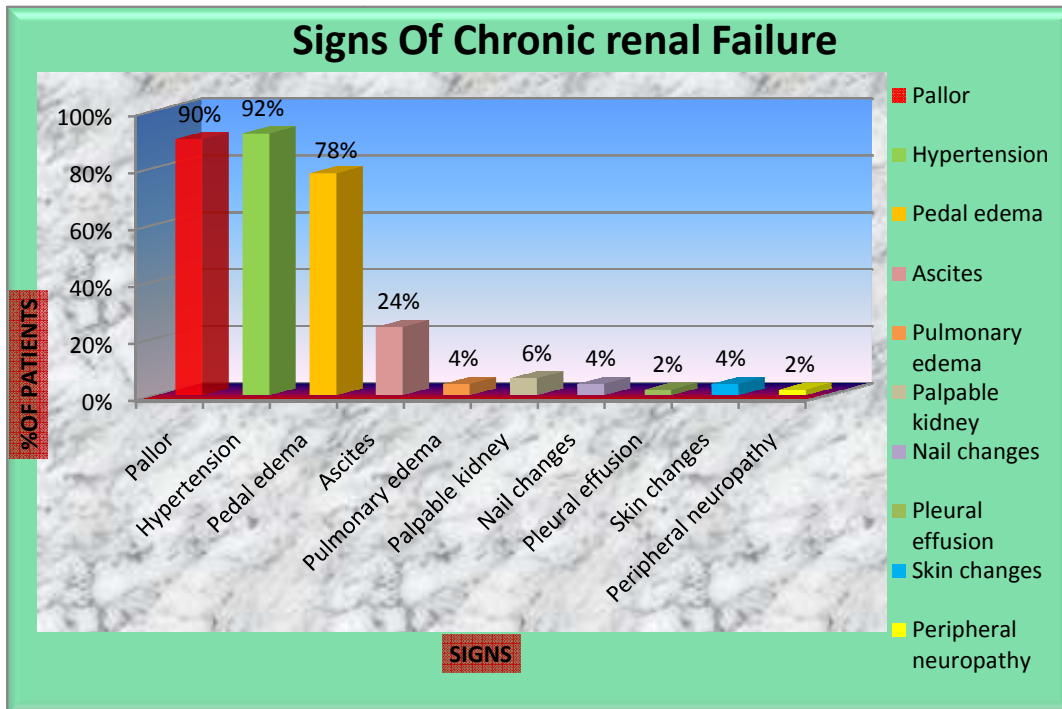
ORIGINAL ARTICLE

Table- : The Comparison between based on Serum Creatinine levels in terms of Haemoglobin, Potassium, Calcium and Albumin Levels.

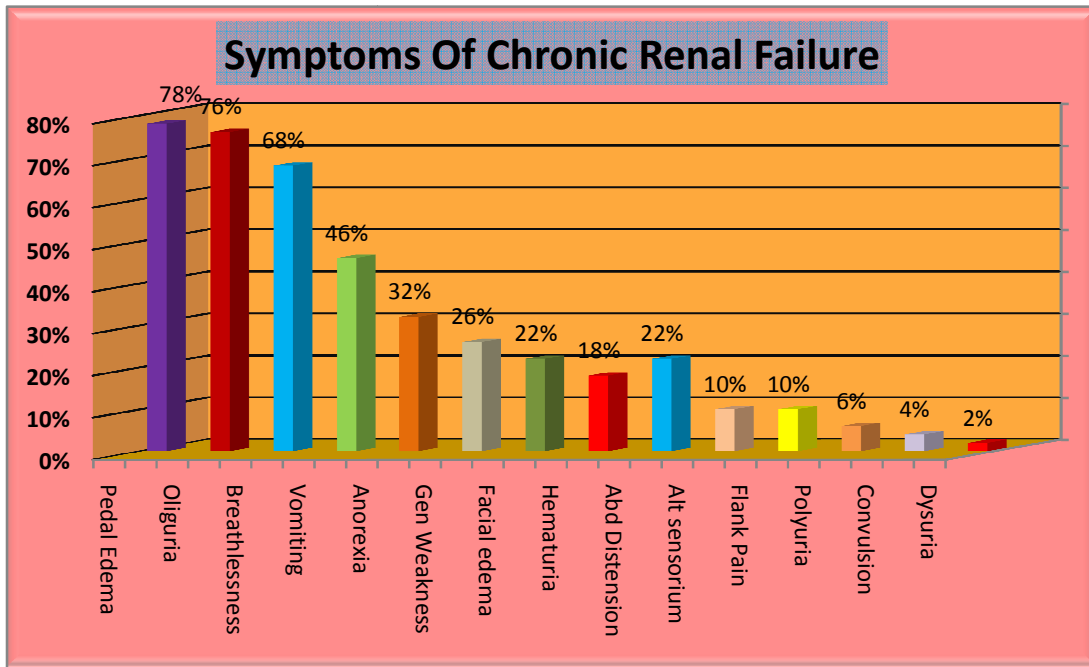
Group	Sr.Creat (mg/dl)	Patients		Hb% (gm/dl)		S.Potassium (mEq/L)		S.Calcium (mg/dl)		S.Albumin (gm/dl)	
		No.	%	Mean	SD	Mean	SD	Mean	SD	Mean	SD
I	2-5	18	36	8.31	2.48	4.51	0.75	8.14	1.10	3.59	0.45
II	5.1-12	31	62	7.48	1.55	4.85	0.88	7.94	0.89	3.56	0.53
III	>12.1	1	2	5.00		5.80		7.60		2.20	
ANOVA		F		2.03		1.76		0.55		3.62	
		P		0.14		0.18		0.58		0.03	
Statistical Significance				NS		NS		NS		S	

p>0.05 Non significant (NS), p<0.05 Significant (S)

Graph- Signs of Chronic Kidney Disease



Graph - : Symptom of Chronic Kidney Disease



LIST OF ABBREVIATIONS USED

CGN	:	Chronic glomerulonephritis
CKD	:	Chronic kidney disease
CPN	:	Chronic pyelonephritis
CRF	:	Chronic renal failure
ESRD	:	End stage renal disease
GFR	:	Glomerular filtration rate
HD	:	Hemodialysis
HTN	:	Hypertension
K/DOQI	:	Kidney disease outcome quality initiative

REVIEW ARTICLE

COMPUTER VISION SYNDROME: A SHORT REVIEW.

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ABSTRACT: Computers are probably one of the biggest scientific inventions of the modern era, and since then they have become an integral part of our life. The increased usage of computers have lead to variety of ocular symptoms which includes eye strain, tired eyes, irritation, redness, blurred vision, and diplopia, collectively referred to as **Computer Vision Syndrome (CVS)**. CVS may have a significant impact not only on visual comfort but also occupational productivity since between 64% and 90% of computer users experience visual symptoms which may include eyestrain, headaches, ocular discomfort, dry eye, diplopia and blurred vision either at near or when looking into the distance after prolonged computer use [1].

KEY WORDS: Computer Vision Syndrome

INTRODUCTION: The generic name of "Computer vision syndrome", it is defined by the American Optometric Association as a complex of eye and vision problems related to the activities which stress the near vision and which are experienced in relation, or during, the use of the computer [2]. The symptoms of computer vision syndrome may vary depending on several factors which includes amount of time spend, viewing distance, seating posture, level of computer screen, and underlying visual acuity disturbances if any. Treatment of computer vision syndrome involves proper identification of the etiologic factors and correction of visual errors if existent. Special attention should be paid to ergonomic factors like correct posture in the chair, lighting arrangement, antiglare screen on the computer and establishing proper working habits.

ETIOLOGY OF COMPUTER VISION SYNDROME: It is difficult to point out a single etiologic factor which causes computer vision syndrome but it is a combination of several factors like prolonged working hours, inadequate rest breaks constantly staring at a single source are some of the important causes of computer vision syndrome.

LOW CONTRAST: Studies have shown that The computer monitor is populated by tiny dots called pixels, the computer screen is difficult for the eye to focus on and these pixels are not uniformly bright and produce slight difference in contrast as a result of which even at high resolutions the edge of the letter looks fuzzy this adds to strain on eyes and is one of the important cause of computer vision syndrome [3].

REVIEW ARTICLE

DURATION OF USE: Most people work 6-7 hour days. If you take a 1 hour lunch break, this still leaves 3.5-4 hour periods during which you are staring at a computer screen. Extended viewing of a computer screen (over 2 hours), especially at a constant depth of field, is the primary cause of CVS.

REDUCED BLINKING: It has been observed that with prolonged use of the computers the blinking rate reduces. The normal blinking rate is about one to two dozen times a minute. Since blinking is important for hydration of eyes reduced blinking is also considered one of the causes of dry eyes and Computer Vision Syndrome.

REDUCED EYE MOVEMENT: During activities in which they are not focused on a computer screen the eye moves through a lesser range of motion when concentrating on a screen. This reduction in eye movement serves to dehydrate the eye, which can, among other things, lead to CVS.

UNCORRECTED VISION PROBLEMS: Preexisting uncorrected vision problems can increase the severity of computer vision syndrome. People who are prescribed eyeglass have to tilt their heads at odd angles because their glasses aren't designed for looking at a computer. They adopt postures to look at the computers which may not be ergonomically correct. Such postures can result in muscle spasms or pain in the neck, shoulder or back.

DIAGNOSIS OF COMPUTER VISION SYNDROME: Computer Vision Syndrome can be diagnosed through a complete clinical eye examination.

PATIENT'S HISTORY: is taken to determine the underlying cause and the presence of any general health problems, medications taken, or environmental factors that may be contributing to the symptoms related to computer use.

VISUAL ACUITY MEASUREMENTS: both for near vision as well as far vision are tested, to assess the extent to which vision may be affected.

A **refraction test is done** to rectify the refractive errors that is existent and needs correction.

In most cases of CVS, the clinician will be able to provide the diagnosis based on the history and the clinical examination. There are numerous accommodative disorders (e.g., decreased amplitude of accommodation) and binocular vision dysfunctions (e.g., phoria, strabismus) that can clearly cause the symptoms. Improperly corrected presbyopia can also result in symptoms. Hyperopia can result in visual symptoms – especially in near workers.

TREATMENT OF COMPUTER VISION SYNDROME

EYE CARE: Patients, both young and old, may benefit from special reading glasses to enhance the clarity of their computer screens and improve their overall comfort. For patients fewer than 40 hours per week, reading glasses to help reduce the strain on their eyes can be very important. Even a mild prescription at near can cause problems for computer usage over a 40

REVIEW ARTICLE

hour work week. Patients over the age of 40 can also benefit from a modified reading glass, typically referred to as computer glasses [4].

ERGONOMIC FACTORS IN COMPUTER USE: Some important ergonomic consideration during computer use are the lighting conditions, chair position, location of reading materials, level on which monitor is placed and the number of breaks taken during each session.

IDEAL COMPUTER SCREEN POSITIONS: it is of considerable importance, ideally it has been noted that computer screen which are 15 to 20 degree below eye levels and which are kept at a distance of 20 -28 inches from eyes provides greatest comforts [5]. It is due to the fact that neck muscles are ideally relaxing in this posture.

CHAIR DESIGNS: the computer chairs are required to be comfortable well padded and should also provide rest to feet. The chairs should be adjustable so as to place feet flat on the ground. It should have a typical arm support while typing.

READING SOURCE: the reading materials required during computer usage should be ideally placed below the monitor and a document holder if available should be used, the goal is to position documents in such a way so as not to move your head between document reading and computer screen reading [5].

ROOM ILLUMINATION: it is essential to position all computer screens to avoid direct glare from lighting sources. Usage of the lower wattage bulbs [5] and proper fluorescence is an important factor in preventing computer vision syndrome. Antiglare screen and filters can also effectively decrease the amount of light reflected from screen.

THE REST PERIODS: every computer user should rest eyes in between when reading computers for prolonged durations. Rests in form of looking at distant objects for at least 20 seconds, frequent blinking in between and relaxing eyes for some time does a real benefit by relaxing accommodation and preventing computer vision syndrome.

THE BLINKING REFLEX: it is one of the inborn reflexes and is considered as one of the fastest reflexes of the body. However this reflex is modified by different physiological activities. It is generally slower when concentrating on a single task. During computer works the eyes are kept wide open and constantly focus on single source and also the blinking reflex drops there is also increased evaporation of the tears due wide opening of eyes. This is one of the factors in development of computer vision syndrome. It also is likely that the higher gaze angle results in a greater percentage of incomplete blinks [6].

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REVIEW ARTICLE

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BLOOD PRESSURE PROFILE OF SCHOOL CHILDREN OF GULBARGA CITY

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ABSTRACT: BACKGROUND: High blood pressure in childhood is a major risk factor for heart disease and stroke in adulthood. There is enough evidence to suggest that the roots of essential hypertension in adults extend into childhood. There is a paucity of literature on the blood pressure measurements amongst children. This study was done to study blood pressure profile of school children in Gulbarga, Karnataka, India. **AIM & OBJECTIVES:** To determine the prevalence of hypertension in children 6–15 years of age and to study the association between selected variables and blood pressure. **MATERIAL & METHODS:** The present study was a school based cross sectional study conducted in 2 Government Primary Schools and 2 Private Secondary Schools of Gulbarga city. For the study 1320 children in the age group 6–15 years were selected. Sample size of 347 was calculated by, using the formula for sample size calculation for single population proportion from a Study where the prevalence of hypertension was 2.42%. The data was collected in a Pre designed pre tested Performa and analyzed using appropriate statistical tests. **RESULTS:** The prevalence of hypertension in the study was found to be 2.42% with 2.4% in females and 2.3% in males. **CONCLUSION:** In the study, hypertension in students was found to be significantly associated with age, height and weight. There was no significant difference in blood pressures of the two sexes, when the values are corrected for maturation status; it was found that body weight and height are the principle determinants of blood pressure. With the onset of puberty spurt in systolic blood pressure was observed in both sexes equally.

KEY WORDS: school children; blood pressure; prevalence

INTRODUCTION: Prevalence of high blood pressure is now commonly observed in children with estimated population prevalence of 1-2% in the developed countries.¹ Hypertension is known to be a major cause of morbidity and mortality in many countries, and the long-term

ORIGINAL ARTICLE

health risks to children with hypertension may be substantial. However, Idiopathic or essential hypertension, for which no identifiable cause is found, clearly can begin in childhood. If untreated, over time high blood pressure can damage many organs of the body, including the heart, brain, kidneys and eyes.²

Many challenges remain in the study of pediatric hypertension. It is known that children who have high blood pressure tend to be hypertensive as adults. It remains to be definitively determined what level of blood pressure predicts hypertensive end-organ injury. The effects of hypertension can begin during childhood. The high blood pressure itself usually has no signs or symptoms, but may be associated with subtle changes in behavior or school performance. You can have it for years without knowing it. During this time, though High blood pressure can damage your heart, blood vessels, kidneys, and other parts of your body. The causes for increase in blood pressure are attributed to obesity, change in dietary habits, decreased physical activity and increasing stress. Elevated blood pressure, systolic or diastolic at any age, in either sex is a contributor for all forms of cardiovascular diseases. Early child hood identifying and modifying risk factors reduces the incidence and complications in adolescents and adults. Prevalence of hypertension varies across countries and states. It is multifactorial disease, influenced by genetic, racial, geographic, cultural and dietary patterns. There is enough evidence to suggest that the roots of essential hypertension in adults extend into childhood. The American Heart Association recommends that, all the children aged 3 years and older should have yearly blood pressure measurements. There is a paucity of literature on the blood pressure measurements amongst children. This study was done to know the blood pressure profile of school children in Gulbarga, Karnataka, India.

OBJECTIVE: To know the prevalence of hypertension in children 6–15 years
and

To study the association between selected variables and blood pressure.

MATERIALS AND METHODS: The present study was a school based cross sectional study conducted in 2 Government Primary Schools and 2 Private Secondary Schools of Gulbarga city. For the study 1320 children of in the age group 6–15 years were selected. Sample size of 347 was calculated using the formula for sample size calculation for single population proportion from a Study,³ where the prevalence of hypertension was 2.42%. Any child with a known medical conditions having direct effect on blood pressure was excluded. One child with Mar fan's syndrome having mitral valve prolapse, was excluded.

DEFINITIONS³: The classification of BP percentiles for this study was determined using normative tables generated from the New data, from the 1999–2000 National Health and Nutrition Examination Survey (NHANES) data submitted by National High Blood Pressure Education Program Working Group on Hypertension Education in Children and Adolescents, which take into account the age, gender and height of each child

Hypertension is defined as a average Systolic Blood pressure (SBP) and or Diastolic Blood pressure (DBP), that is >95th percentile for gender, age, and height on three or more occasions.

Pre-hypertension in children is defined as average SBP or DBP levels that are >90th percentile but <95th percentile.

ORIGINAL ARTICLE

Normal BP is defined as a SBP and DBP that is less than the 90th percentile for sex, age, and height. Revised Blood pressure tables were used to determine the percentiles.

A preformed questionnaire was designed and pre-tested on 44 students (excluded from study) on a school in the nearby and validated during pilot study. This study was done using predesigned questionnaire, by interview techniques, followed by measurements of height and weight, Age was recorded as per school records, Blood pressure was measured by using standardized mercury sphygmomanometer, as per standard guidelines with an appropriately sized cuff on three different occasions. The systolic blood pressure was determined by the onset of the “tapping” Korotkoff-1 sound and the diastolic at its disappearance (Korotkoff-5). Students found to have pre-hypertension (SBP or DBP >90th percentile) or hypertension (SBP or DBP >95th percentile) on first visit were re-examined on at least three different occasions to conclude the presence or absence of hypertension.

The English questionnaire was translated to Kannada. The data was collected and analyzed using appropriate statistical tests. The mean systolic and mean diastolic blood pressures with the standard deviations, for each age, sex, and various percentiles were determined. Similarly mean systolic and mean diastolic blood pressure with standard deviation were determined in different weight and height groups.

The physical instruments used in the study were a weighing machine, portable anthropometric rod and mercury sphygmomanometer with different cuff sizes. Calibration of the instruments was carried out. Different cuff sizes as recommended by the 2004 update of American Academy of Pediatrics on Hypertension⁶ were used.

RESULTS: One thousand three hundred and twenty, apparently normal school children, between 6-15 years of age were studied to define norms of auscultatory blood pressure. Out of 781 were boys and 539 were girls. The mean systolic blood pressure for boys and girls was 104.78 ± 9.24 and 104.55 ± 8.84 respectively and mean diastolic blood pressure was 66.72 ± 6.66 for boys and 66.69 ± 6.15 for girls and 320 (24.24%) children had family history of hypertension.

Table 1 shows the comparative values of mean blood pressure for boys and girls. Systolic BP ranged from 68mmHg to 132mmHg in boys and 90-128mmHg in girls. The mean systolic Blood pressure in the age group of 6 to 15years ranged from 96.12 mmHg to 114.77 mmHg in boys and 95.4 mmHg to 113.29mmHg in girls. A spurt in mean systolic blood pressure was observed between 13-14years and 14-15years of age.

Diastolic BP ranged from 50 to 96mmHg in boys and 50-84mmHg in girls. where as the mean Diastolic Blood Pressure ranged from 62.22 mmHg to 73.59 mmHg and 62.49 mmHg to 72.87mm Hg for 6 to 15 years of age in boys and girls respectively.

Table 2 revealed in boys mean systolic blood pressure with respect to weight ranged from 96.84mm of Hg(10-15 kg group) to 116.81mm Hg(46-50 kg group), where as mean diastolic blood pressure ranged from 63.29mm of Hg to 74.63mm Hg. In girls, mean systolic blood pressure with respect to weight ranged from 97.62mm Hg (10 to 15 kg group) to 117.60mm Hg (46-50 kg group) where as mean diastolic blood pressure ranged from 64.28mm Hg to 76.40mm Hg.

Table 3 Indicates boys with respect to height mean systolic blood pressure ranged from 96.12mm Hg (91to100cm group) to 118.28mm Hg (161to170cms group) where as mean diastolic blood pressure ranged from 61.86mm of Hg to 76.00mm Hg. In girls with respect to height, mean systolic blood pressure ranged from 96.57mm Hg (91to 100cms group)

to 120.26 mm Hg (161 to 170 cm group), whereas mean diastolic blood pressure ranged from 62.57 to 77.60 mm Hg.

The mean systolic and mean diastolic pressure were found to increase with increasing age, the increase in the mean systolic blood pressure being approximately 1.5 to 2 mm Hg per year. The increase in mean diastolic was approximately 1 mm Hg per year. Both systolic and diastolic blood pressure were found to have significant correlation with weight and height and hence with weight/height ratio in both sexes.

The mean systolic blood pressures and diastolic blood pressures in boys and girls were compared. It was found that the systolic and diastolic blood pressures were slightly higher in boys than in girls. However the difference was not statically significant.

Table 4 reveal the overall prevalence of hypertension in the present study was 2.42% (32). Of these 32 hypertensive children 18 were boys amounting to 2.3% of total number of boys and 14 were girls amounting to 2.4% of total number of girls. The prevalence of hypertension was more in the 9 year old boys where as it was in 14 year old girls. All the 32 children had only mildly elevated blood pressure levels (i.e >95th percentile but <99th percentile).

DISCUSSION: The finding of the present study regarding mean systolic and mean diastolic blood pressure are comparable with findings of the study conducted by N.K. Anand and Lalit Tandon.⁴ Their findings (systolic blood pressure) of 96.3 mm Hg at 6 years and 116.5 mm Hg at 15 years for boys and 95 mm Hg and 116.4 mm Hg at 15 years for girls are close to the findings of the present study. Similarly diastolic blood pressure for both boys and girls in the present study and the study conducted by N. K. Anand Lalit Tandon are comparable.⁴

The systolic spurt observed in the present study between 13-14 years in both sexes has been supported by Agarwal Rajiv, Sharma, AK Shrivastava, Premkumar and CM Pandey who observed similar spurts in systolic blood pressure in both sexes between 12 and 13 years of age.⁵ Raksh Agarwal, SL Mandowara, B Bhandri and Garg OP also observed a spurt in blood pressure between 12 and 13 years.⁶ The steep rise in systolic blood pressure was also observed by Londe between 5 to 6 years in boys, 4 to 5 years in girls and between 14 to 15 years in both sexes.⁷

However, Task Force Committee USA reported only once spurt between 5 and 6 years in both sexes. The gradual increase in the blood pressure along with increase in age can be explained by the fact that, the body mass also increases, which is one of the determinants of blood pressure along with age.⁸

The systolic spurts observed in the present study can be accounted by the onset of puberty in both sexes, which results in increase of body weight and height, as a result of increase in muscular tissue in boys and deposition of adipose tissue in girls which begins around 11 to 12 years and reaches peak levels by 14-15 year of age.

The observations of mean diastolic pressure in the present study resemble those of the study conducted by N K Anand and Lalit Tondon.⁴ In the present studies it range from 61.88 mm Hg at 6 years to 73.9 mm Hg at 15 years in boys where as from 62.09 mm Hg at 6 years to 72.8 mm Hg at 15 years in girls.

In the study conducted by N K Anand and Lalit Tondon it ranged from 64.4 mm Hg at 6 years and 76.9 mm Hg at 15 years in boys and 64.3 mm Hg at 6 years and 76.3 mm Hg at 15 years in girls.⁴ Rakesh Agarwal, SL Mandowara, B Bhandari and Garg OP reported a diastolic blood pressure range of 65 to 77 mm Hg for boys and 67.78 mm Hg for girls in 5-15 years of age group.⁶

ORIGINAL ARTICLE

All above studies including present study shown approximate increase of diastolic pressure 1 mm Hg per year of age. There is a spurt of diastolic blood pressure in 13-14 years of age group in females in the present studies.

The findings of the present study are in agreement with the statement that height and weight are the strongest determinants of the blood pressure.

It can be seen from the results of the present study, that there were very little differences in the mean systolic blood pressure and mean diastolic blood pressure in all age groups, in between girls and boys.

In the present study the overall prevalence of hypertension as found to be 2.42%, 2.3% of total number of boys and 2.4% of total number of girls. Findings of current study were in the range of the study conducted by Sukumar 2% Londe 2.3% and R Agarwal 2.6%.^{9,7,6}

CONCLUSION: The overall prevalence of hypertension in the present study was 2.42%. Of these 32 children, 18 were boys amounting to 2.3% of total number of boys and 14 were girls amounting to 2.4% of total number of girls. The findings of the present study are in agreement with the statement that the blood pressure, both systolic and diastolic gradually increases with age, although such an increase is not a steady one. It can be seen from the results of the present study that there were very little differences in systolic blood pressure and diastolic blood pressure in all groups in between girls and boys. The findings of the present study are in agreement with the statement that height and weight are the strongest determinants of the blood pressure.

RECOMMENDATIONS: Blood pressure recording should be a part of school health program and also of clinical examination of children, attending health care system, to identify and treat hypertension early to prevent the late complications.

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ORIGINAL ARTICLE

Table 1 Age wise comparison of mean blood pressure between boys and girls.

Age in years	Systolic Blood Pressure		Diastolic Blood Pressure	
	Boys Mean±SD mmHg	Girls Mean±SD mmHg	Boys Mean± SD mmHg	Girls Mean±SD mmHg
6	96.12 ±5.13	94.41±5.31	62.22±4.49	62.49±4.31
7	98.22±6.86	98.67±7.55	62.58±4.14	62.40±5.43
8	102.15±7.43	99.55±7.55	63.35±6.92	62.75±6.89
9	103.62±8.87	102.23±6.92	65.35±7.05	63.71±4.73
10	104.41±7.91	104.65±7.60	66.30±5.81	66.51±6.79
11	105.08±8.23	105.24±7.95	68.02±6.78	66.88±4.42
12	106.24±8.14	107.85±7.05	68.60±5.29	67.28±3.12
13	108.45±7.20	108.22±10.80	69.06±4.86	68.71±5.57
14	111.64±7.18	110.56±6.39	70.89±4.96	71.78±3.37
15	114.77±5.29	113.29±6.67	73.59±4.96	72.87±4.40

Table 2: Showing the distribution of boys and girls according to weight and Blood Pressure.

Weight (Kgs)	Boys					Girls				
	No:	SBP (mmHg)		DBP (mmHg)		No:	SBP (mmHg)		DBP (mmHg)	
		Mean	SD	Mean	SD		Mean	SD	Mean	SD
10-15	82	96.84	7.25	63.29	5.99	70	97.62	8.25	64.28	6.34
16-20	266	99.30	7.32	63.58	5.10	169	100.53	7.12	64.90	5.27
21-25	173	104.90	8.10	66.64	6.52	65	105.89	7.96	66.90	5.73
26-30	123	108.32	7.81	69.86	5.77	150	110.28	8.20	70.86	4.61
31-35	53	110.67	7.81	71.20	5.83	37	111.62	11.80	72.21	3.90
36-40	48	113.04	6.11	72.04	4.35	32	114.68	6.23	72.40	3.48
41-45	14	115.57	8.34	74.28	8.37	11	116.90	6.59	76.30	2.19
46-50	22	116.81	6.06	74.63	6.02	5	117.60	5.17	76.40	2.19

ORIGINAL ARTICLE

Table 3:- Relationship between blood pressure status sex and height group.

Weight (Kgs)	Boys					Girls				
	No:	SBP (mmHg)		DBP (mmHg)		No:	SBP (mmHg)		DBP (mmHg)	
		Mean	SD	Mean	SD		Mean	SD	Mean	SD
91-100	24	96.12	5.04	61.86	6.85	21	96.57	6.93	62.57	3.85
101-110	74	97.08	6.34	62.08	5.56	50	96.90	5.55	63.32	3.99
111-120	207	101.21	7.56	63.70	4.61	126	100.90	8.24	64.28	6.88
121-130	168	104.10	8.08	68.11	7.16	124	104.70	7.76	67.95	5.02
131-140	151	107.84	8.02	69.05	6.07	118	107.00	9.23	70.06	4.67
141-150	93	110.32	7.09	70.70	4.54	74	109.35	8.10	70.47	4.96
151-160	50	114.16	6.98	73.00	5.30	20	113.30	13.14	74.42	3.76
161-170	14	118.28	7.35	76.00	6.88	06	120.26	4.80	77.60	4.33

Table 4:- Showing prevalence of hypertension as per fourth Report.

Age in years	Boys				Girls			
	Total No of boys	cut off point (95 th percentile) mmHg	Hypertensive		Total No of girls	cut off point (95 th percentile) mmHg	Hypertensive	
			no	%			No	%
06	87	104/68	2	2.29	53	104.8/68	2	3.77
07	79	107/70	2	2.53	59	120/68.8	2	3.38
08	93	114/80	2	2.15	40	110.3/72.9	2	5
09	81	118/80	4	4.94	56	112/72.5	1	1.78
10	73	120/74.8	2	2.73	70	119/80	1	1.43
11	74	120/78.7	1	1.35	45	12/71.6	1	2.22
12	69	121.2/78.4	1	1.45	59	120/74	0	0
13	66	118/73.5	1	1.51	63	123.6/74	1	1.58
14	100	124.1/78	2	2	46	118/76	3	6.52
15	59	122/78	1	1.69	48	127.3/82.6	1	2.08
Total	781		18	2.3	539		14	2.4

STUDY OF PREVALENCE OF HYPERTENSION IN RURAL POPULATION OF KERALA

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ABSTRACT: BACKGROUND: Hypertension is one of the important causes of cardiovascular morbidity and mortality. With change in lifestyle and increase in life expectancy in India, hypertension is emerging as an important public health problem. **AIM & OBJECTIVES:** To assess the prevalence of hypertension in rural population To correlate the prevalence with epidemiological factors. **METHODS:** A community based cross sectional survey was conducted in rural Kerala and 459 subjects were studied. Height weight and blood pressure of subjects were measured using standardized techniques. **RESULTS:** The overall prevalence of hypertension in our study was 19.82%. Prevalence of hypertension increased with age but did not vary with sex. The prevalence of hypertension was strongly associated with body mass index (BMI). **CONCLUSIONS:** This rural study showed a high prevalence of hypertension. This observation emphasises need to improve screening, treatment and control of hypertension in this population.

KEYWORDS: Cardiovascular Morbidity, urbanization, industrialization

INTRODUCTION: India is facing a dual burden of communicable and non-communicable diseases. As per WHO report hypertension ranks fourth among highly prevalent diseases in the world¹. Hypertension is the one of major risk factor for cardiovascular mortality, which accounts for 20-50 percent of all deaths².

Because of changes in lifestyle and environment, industrialization and urbanization the prevalence of hypertension is increasing. At the same time as a result of increased life expectancy hypertension is emerging as a major health problem.

As socio-demographic differences between urban and rural population are diminished, hypertension has penetrated rural population. A community based survey was conducted in field practice area of KMCT Medical College to find out prevalence of hypertension and to study some socio-demographic factors affecting hypertension.

ORIGINAL ARTICLE

AIM & OBJECTIVES: To Assess the prevalence of hypertension in rural population. To correlate the prevalence with epidemiological factors.

MATERIALS AND METHODS: A community based cross-sectional survey was conducted in the villages of Mukkam Panchayat. This study was a part of ongoing family health survey conducted in field practice area of KMCT Medical College, Manasserry, P. O. Mukkam. A house to house survey was carried out and all members aged above 20 years were included in present study. Detailed information regarding age, sex, educational status, marital status, occupation, religion, etc. was obtained using predesigned questionnaire.

Height and weight of individual was measured using standard techniques. Blood pressure was measured by mercury sphygmomanometer, pulse obliteration and auscultation method in sitting position. Two separate reading at an interval of minimum 10 minutes were taken and average was calculated. The hypertension was defined as systolic BP equal to or more than 140 mm of Hg or diastolic BP equal to or more than 90 mm of Hg or those individuals currently taking antihypertensive treatment.^[3] Data was then analyzed for the results.

RESULTS: A total of 459 persons were screened for hypertension. Distribution of population according to their socio-economic class and religion is shown in table 1. Out of 459 persons screened for hypertension, 91 had hypertension, giving the prevalence rate of 19.82%. The overall prevalence of hypertension was little more in males i.e. 21.35% than in females i.e. 18.57%, but prevalence of hypertension among females more than 40 years of age was higher than males in the respective age group (table-3). However this difference was not statistically significant. Increase in prevalence was observed with increase in age in both sexes. This was statistically significant.

In present study out of 459 subjects 98 (21.35%) were overweight (BMI- 25 to 29.9), while 19 (4.13%) were obese. It was observed that prevalence of hypertension increased with increase in BMI (table-4) and this increase was also statistically significant.

DISCUSSION: Hypertension is a major public health problem in India. Various studies conducted in Kerala have estimated the prevalence of hypertension ranging from 17.9% in 1993^[4] to 51.8% in 2000.^[5] However, the study results were not consistent, due to variations in the lifestyles in different parts of country and also different age composition of the study population.

The overall prevalence of hypertension in the study subject was 19.82%. The prevalence of hypertension was increased with the increase in age, it was minimum i.e. (7.27%) in age group of 20-29 years, while it was maximum (36.84%) in age group of above 60 years. Similar findings have been reported by other authors.^[6,7] Though in present study prevalence of hypertension in males 21.35% was higher than prevalence in females 18.57%, the difference was not significant. Contradictory but non-significant association between sex and prevalence has been also reported by other authors too.^[6,8,9]

A positive association was observed between body mass index and prevalence of hypertension. Overweight and obese persons were definitely at higher risk of hypertension. The similar findings were reported by other studies. ^[7,10]

CONCLUSIONS: The overall prevalence of hypertension in the study subjects was 19.82%. The prevalence of hypertension increased with increase in age and BMI. From this study it is evident

ORIGINAL ARTICLE

that hypertension is not only a concern of the urban population, but also it has penetrated in rural areas.

RECOMMENDATIONS: Hypertension is one of the important risk factors for coronary heart disease, which is one of the important leading causes of death. Mass screening programme should be started to detect persons at risk of developing hypertension.

Information, education, and communication activities (IEC) should be started to increase the awareness of people to adopt healthy life styles like regular physical exercise, restricted salt intake, avoidance of alcohol and smoking.

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Table - 1: Distribution of population according to socio-economic status and religion.

Socio-economic class*	Religion			Total
	Hindu	Muslim	Christain	
I	12	29	0	41
II	48	67	02	117
III	98	77	08	183
IV	57	29	04	90
V	19	09	0	28
Total	234	211	14	459

ORIGINAL ARTICLE

*(Socioeconomic class as per B.G.Prasad classification updated for June 2011)

Table -2: Age distribution of hypertensives

Age	Total no. Of persons	No. Of persons with hypertension	Prevalence of hypertension in %
20-29	110	8	7.27
30-39	87	11	12.64
40-49	103	17	16.5
50-59	64	20	31.25
≥ 60	95	35	36.84
Total	459	91	19.82
$\chi^2 = 36.96, df = 4, p < 0.001$			

Table-3: Age and sex distribution of persons with hypertension

Age	Males			Females		
	Total no. Of subjects	Subjects with hypertension	Prevalence in %	Total no. Of subjects	Subjects with hypertension	Prevalence in %
20-29	39	3	7.69	71	5	7.04
30-39	38	7	18.42	49	4	8.16
40-49	49	8	16.32	54	9	16.67
50-59	31	9	29.03	33	11	33.34
≥ 60	49	17	34.69	46	18	39.13
Total	206	44	21.35	253	47	18.57

Table-4: Relationship between B.M.I. and hypertension

BMI	No. Of persons in group	Hypertensives	Normotensives	Prevalence of hypertension in %
<18.5	79	10	69	12.65
18.5-24.9	263	35	228	13.3
25-29.9	98	37	61	37.75
>30	19	9	10	47.36
Total	459	91	368	19.82
$\chi^2 = 38.36, df = 3, p < 0.001$				

STUDY OF BIOFILM FORMATION AS A VIRULENCE MARKER IN CANDIDA SPECIES ISOLATED FROM VARIOUS CLINICAL SPECIMENS.

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ABSTRACT: BACKGROUND: Candida species can be either commensals or opportunistic pathogens with the ability to cause a variety of infections, ranging from superficial to life threatening. Nosocomial infections due to candida are also becoming increasingly important. Early and prompt diagnosis, proper treatment and prevention of candidemia due to biofilms pose a major challenge for microbiologists and clinicians worldwide. Added to this is the emerging trend of antifungal drug resistance among the biofilm producing strains of Candida.

AIMS: The aim of this study was to detect biofilm production in Candida species isolated from various clinical samples obtained from patients hospitalized in Dr. B.R Ambedkar Medical College and Hospital. **MATERIALS AND METHODS:** A total of 108 Candida species (Candida albicans 49 and non-albicans Candida 59 species) isolated from various specimens (urine, blood, respiratory tract, genital samples, plastic devices and pus samples) were included in the study. The various candida isolates were identified by using conventional methods and their ability to produce biofilm was detected by the tube method. **RESULTS:** Out of 108 candida species, non-albicans Candida 59 (54.63%) was the predominant species isolated. Biofilm positivity was seen with 71 (65.74%) isolates and the biofilm production was observed more with non-albicans Candida species 44 (61.97%) compared to C.albicans species 27 (38.03%). Among the non-albicans Candida species, strong biofilm producers were C.krusei (80.77%) and C.tropicalis (72.73%). Biofilm positivity was found to be higher in the bloodstream Candida isolates (81.82%) compared to isolates from other sites. **CONCLUSION:** The present study suggests an increasing prevalence of non-albicans Candida species in the various clinical samples isolated and also shows them as strong biofilm producers compared to C.albicans species. These data suggest that, biofilm formation as a potential virulence factor might have a higher significance for non-albicans Candida species than for C.albicans and also that the biofilm structure varies with the different species and strains of candida, the nature of the colonized surface and its localization. Thus more remains to be determined about biofilms formed by the non-albicans Candida species as they are now frequently encountered species in catheter associated candidaemias.

KEY WORDS: Candida, biofilm, non-albicans Candida, candidaemia

INTRODUCTION: Pathogenic fungi in the genus *Candida* are capable of causing a variety of infections ranging from superficial to deep-seated mycoses. The *Candida* species have been recognized as the fourth commonest cause of nosocomial invasive infections.¹

Candida organisms are commensals; and to act as pathogens, interruption of normal host defences is necessary. Therefore, general risk factors for *Candida* infections include immune-compromised states, diabetes mellitus, and iatrogenic factors like antibiotic use, indwelling devices, intravenous drug use, and hyperalimentation fluids. Candidiasis has emerged as an alarming opportunistic disease as there is an increase in number of patients who are immune-compromised, aged, receiving prolonged antibacterial and aggressive cancer chemotherapy or undergoing invasive surgical procedures and organ transplantation. The virulence factors expressed by *Candida* species, to cause infections may vary depending on the type of infection, the site and stage of infection and the nature of the host response.² One of the important factors contributing to the virulence of *Candida* is the formation of surface-attached microbial communities known as “biofilm”.³

Biofilms are defined as structured microbial communities that are attached to a surface and encased in a matrix of exopolymeric material. A typical laboratory fungal model of biofilm formation involves two operational steps: (a) adhesion and (b) biofilm growth and maturation and has 3 distinct developmental phases: early (0-11 h), intermediate (12-30 h) and mature (38-72 h). The detailed structure of mature *C. albicans* biofilms consists of a dense network of yeast, hyphae and pseudohyphae.⁴

The advantages of forming biofilm include protection from the environment, nutrient availability, metabolic cooperation and acquisition of new traits.² This is of particular significance since it is now estimated that a significant proportion of all human microbial infections involve biofilm formation. It has been estimated that some 65% of all human microbial infections involve biofilms. Biofilm formation helps the organism to evade host defences, exist as a persistent source of infection and develop resistance against antifungal agents. *Candida* species are frequently found in the normal microbiota of humans, which facilitates their encounter with most implanted biomaterials and host surfaces.⁵ The resistance of biofilm producing *Candida* species to antifungal agents represents a major challenge especially in the design of therapeutic and prophylactic strategies. These factors constitute a clinical problem, resulting in high mortality as well as economic problem due to prolonged hospital stay.⁶

The role of bacterial biofilms in disease has been investigated in detail over a number of years and considerable literature is available on their structure and properties. However, sufficient literature is hard to find on medically relevant fungal biofilms particularly, in the prevailing scenario where immune-compromised conditions and nosocomial infections are on the rise. Consequently further recognition and understanding of *Candida* biofilms, is of major importance in the study of human candidiasis. Therefore this study aims to provide insights on various aspects of *Candida* biofilms and their role in pathogenesis.

MATERIALS AND METHODS: In this study, a total of 108 clinical isolates of *Candida* were collected from patients hospitalized in Dr. B.R Ambedkar Medical College and Hospital during a period of 6 months i.e. from May 2012 to October 2012. These patients had no history of antifungal drug exposure prior to collection of sample.

Out of the 108 *Candida* isolates, 34 were obtained from urine,²⁷ from respiratory tract (sputum, bronchial wash, tracheal secretion), 22 from blood, 16 from genital samples, 6

from plastic devices (endotracheal tube, catheter tip) and 3 from pus samples [Table 1]. The urine isolates were obtained from catheterised patients with symptoms of urinary tract infections, the respiratory samples were from pulmonary tuberculosis cases and the bloodstream isolates were collected from ICU patients with catheter related septicemias. The genital samples were collected from cases with vulvovaginal candidiasis. The plastic devices were from ICU patients and the pus samples were laboratory isolates.

The candida isolates obtained were further identified by conventional methods such as germ tube test [figure 1], microscopic morphology on cornmeal agar [Figure 2] and sugar fermentation and assimilation tests.⁷ Culture on CHROM agar was also used for identification of the species [Figure 3].

BIOFILM FORMATION: Biofilm production was detected by tube method described by Brachiniet al.⁸ A loopful of organisms from Sabouraud's Dextrose agar (SDA) plate was inoculated into Sabouraud's Dextrose broth supplemented with glucose (Final concentration 8%). The tubes were then incubated at 37°C for 24 hours after which the broth was aspirated out gently. The tubes were then washed once with distilled water and then stained with 1% Safranin. The tubes were then kept still for 7 minutes. Safranin then was removed and tubes were examined for biofilm production. Biofilm production was tested twice and read independently by two different observers. The adherent biofilm layer was scored visually as either negative or weak positive (1+), moderate positive (2+) or strong positive (3+) [Figure 4].

STATISTICAL ANALYSIS: The analysed results were expressed as percentages for the description of candida isolates according to species and various clinical samples. Microsoft excel was used for the interpretation of these results.

RESULTS: Among the 108 Candida isolates, 59 (54.63%) were non- albicans Candida species and 49 (47.37%) were Candida albicans (*C.albicans*). Among the non- albicans Candida species, the most common isolate was *C.krusei* 26 (24.07%) followed by *C.tropicalis* 11 (10.19%). Other species isolated were *C.glabrata* 8 (7.41%), *C.kefyr* 7 (6.48%), *C.parapsilosis* 4 (3.7%) and *C.dublinsiensis* 3 (2.78%). [Chart 1]

The Candida isolates obtained from different clinical samples are shown in table 1.

Out of 108 candida species tested 71 (65.74%) were found to be biofilm producers. Biofilm production was found to occur most frequently among non-albicans Candida 44 (61.97%) than Candida albicans 27 (38.03%).

Among the non-albicans Candida species, *C. krusei* 23 (80.77%) was the highest biofilm producer followed by *C.tropicalis* 8 (72.72%). [Table 2 and Chart 2].

The results of biofilm production were also analysed with respect to the site of infection. The biofilm positivity was observed more with bloodstream isolates (81.82%) and least with isolates from respiratory tract (40.74%) [Table 3 and Chart 3].

DISCUSSION: The incidence of nosocomial candidiasis has increased dramatically over the last few decades. Their emergence as important nosocomial pathogens is related to specific risk factors associated with modern medical procedures, notably the use of immunosuppressive and cytotoxic drugs, powerful antibiotics, and implanted devices of various kinds.¹

Biofilms are a collection of microorganisms surrounded by the slime they secrete. The ability to form biofilms is associated with the pathogenicity and as such should be considered as an important virulence determinant during candidiasis.⁹

In our study we evaluated 108 candida species from various clinical samples, namely urine, blood, respiratory tract, genital samples, plastic devices and pus. Our data showed predominance of non-albicans Candida species 59(54.63%) compared to *C.albicans*49(45.37%). Studies by Mujika et al¹⁰ and Shin et al¹¹ also indicate a trend towards an increasing prevalence of infections caused by species of non-albicans Candida. In the present study 65.74% of the Candida isolates tested were found to be biofilm producers. This finding is in concordance with studies conducted by Muni et al., 2012(64%)⁹ and Mohandas et al., 2011(73%)². Biofilm production was found to occur most frequently among Non-albicans Candida species (61.97%) than *C.albicans*(38.03%). Similar findings have been reported by Girish et al., 2006¹² and Muni et al., 2012⁹). Among the non-albicans Candida species, the biofilm positivity occurred most frequently among isolates of *C.krusei* (80.77%), followed by *C.tropicalis* (72.73%), *C.dubliensis* (66.66%), *C.kefyr* (57.14%), and *C.parapsilosis* (50%). [Table 2 and chart 2]. *C.krusei* and *C.tropicalis* have also been recognized as strong slime producers by many studies (Dag et al., 2010¹³; Mohandas et al., 2011² and Vinitha et al., 2007¹⁴).

Our study also showed correlation between biofilm productions by the various Candida isolates with respect to their source of isolation. Nearly 81.82% of the bloodstream isolates showed higher biofilm positivity (studies by Girish et al.,¹² also showed similar results), followed by urine isolates (73.53%), genital samples (68.75%), pus and plastic devices (66.67%) and respiratory tract samples (40.74%) [Table 3 and chart 3]. The bloodstream isolates were collected from ICU patients with catheter related septicemias. Most of these infections are caused by microorganisms that invade the intracutaneous wound during catheter insertion or thereafter.¹⁵ The cultures from blood samples yielded *C.krusei* predominantly. The isolation of non-albicans Candida species in catheter associated bloodstream infections have been frequently encountered in the past few decades.¹⁶ The urine isolates were obtained from catheterised patients with symptoms of urinary tract infections and the cultures yielded mainly *C.albicans*. The Candida species isolated from plastic devices (endotracheal tube, catheter tip) also showed 66.67% of biofilm positivity. These devices become colonized by the candida that forms biofilm, the detachment of which can result in candidemia. Indwelling catheters therefore, represent a major risk factor associated with nosocomial Candida infections.¹⁴ Devices such as stents, shunts, prostheses, implants, endotracheal tubes, pacemakers, and various types of catheters, to name a few, have all been shown to support colonization and biofilm formation by Candida.⁵ The least biofilm producers were the isolates from respiratory tract (40.74%) which were obtained from pulmonary tuberculosis cases and these results were in concordance with studies done by Muni et al., 2012.⁹

Candida biofilms may help maintain the role of fungi as commensals and pathogen, by evading host immune mechanisms, resisting antifungal treatment, and withstanding the competitive pressure from other organisms. Consequently, biofilm related infections are difficult to treat.¹⁷ Hence the study emphasizes the need for an effective anti-biofilm treatment which requires improved knowledge of the pathogen itself, and also of the host response to adhesion and biofilm formation, the properties of the substrates onto which the biofilm develop and the interactions within microbial communities.

To conclude, biofilm formation as a virulence factor might have a higher significance for non- albicans Candida species than for *C. albicans* and also this ability to form biofilms is

intricately linked with the ability of the organisms to adhere, colonize and subsequently cause infection in susceptible individuals.

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ORIGINAL ARTICLE

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Table 1: Candida species isolated from different clinical samples (n=108)

No. of candida species isolated	Urine	Respiratory tract	Blood	Genital samples	Plastic devices	Pus
C.albicans(49)	16	12	5	12	2	2
C.krusei (26)	5	9	8	1	2	1
C.tropicalis(11)	3	4	3	0	1	0
C.glabrata(8)	6	0	1	1	0	0
C.kefyr (7)	3	0	1	2	1	0
C.parapsilosis(4)	1	0	3	0	0	0
C.dublinsiensis(3)	0	2	1	0	0	0
Total (108)	34	27	22	16	6	3

Table 2: Biofilm production by various Candida species

Candida spp.	Total no. of isolates	No. of biofilm negative	No. of biofilm positive			Total no. of biofilm positive
			3+	2+	1+	
C.albicans	49(45.37%)	22(44.9%)	3	12	12	27(55.10%)
C.krusei	26(24.07%)	3(11.54%)	6	9	8	23(80.76%)
C.tropicalis	11(10.19%)	3(27.27%)	3	2	3	8(72.73%)
C.glabrata	8(7.41%)	3(37.5%)	1	2	2	5(62.5%)
C.kefyr	7(6.48%)	3(42.86%)	0	2	2	4(57.14%)
C.parapsilosis	4(3.70%)	2(50%)	1	1	0	2(50%)
C.dublinsiensis	3(2.78%)	1(33.33%)	1	1	0	2(66.67%)
Total	108	37(34.26%)	15	29	27	71(65.74%)

Table 3: Biofilm production in various clinical samples

Nature of specimen	Total no. of isolates	No. of biofilm negative	No of biofilm positive			Total no. of biofilm positive
			3+	2+	1+	
Urine	34(31.48%)	9(26.47%)	6	10	9	25(73.53%)
Respiratory tract	27(25%)	16(59.26%)	2	7	2	11(40.74%)
Blood	22(20.37%)	4(18.18%)	3	5	10	18(81.82%)
Genital samples	16(14.81%)	5(31.25%)	1	5	5	11(68.75%)
Plastic devices	6(5.55%)	2(33.33%)	2	1	1	4(66.67%)
Pus	3(2.78%)	1(33.33%)	1	1	0	2(66.67%)
Total	108	37(34.26%)	15	29	27	71(65.74%)

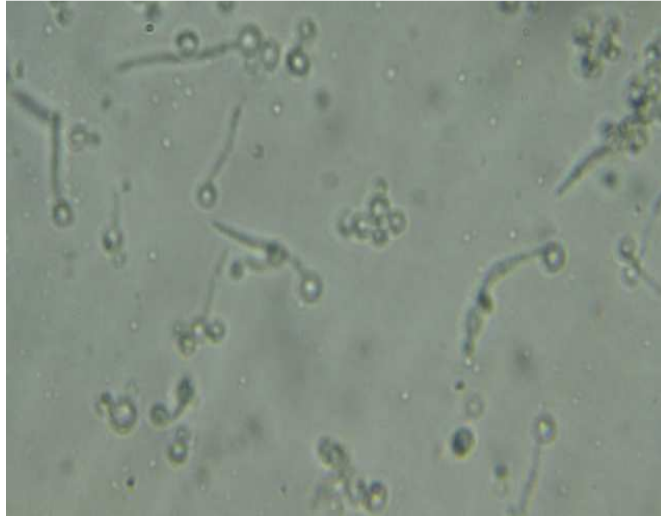


Figure 1. Germ tube formation by *C. albicans*

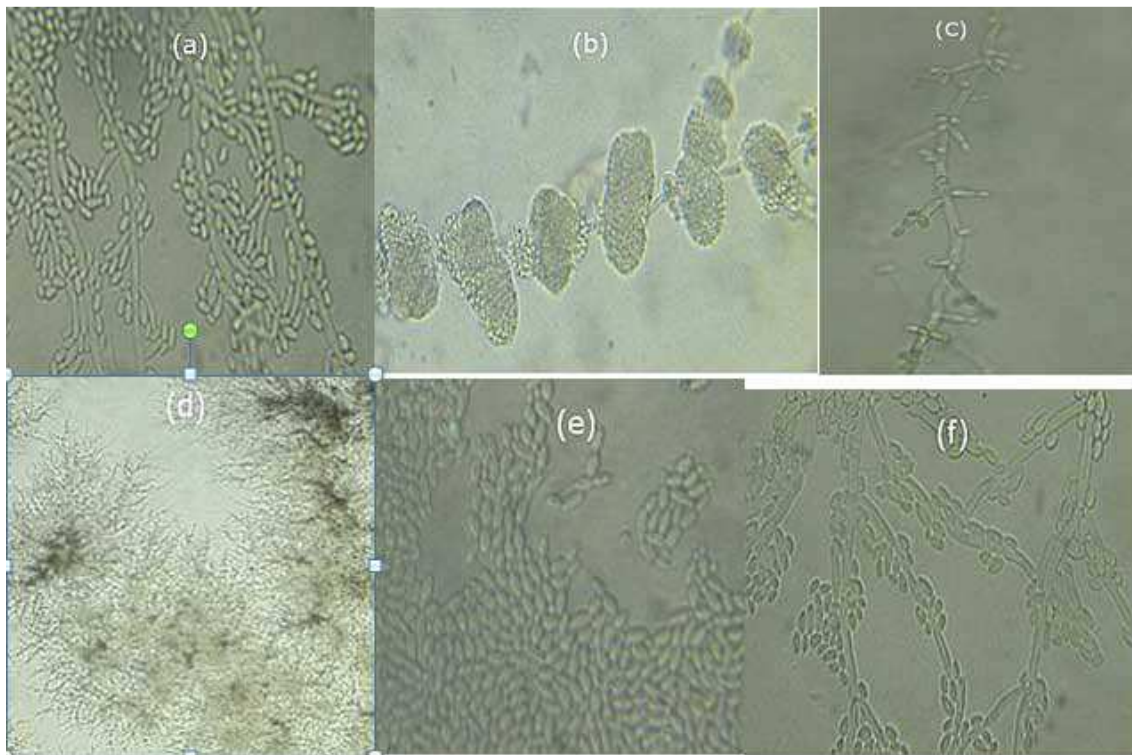


Figure 2. Microscopic morphology on cornmeal agar: *C. krusei* (a), *C. albicans* (b), *C. tropicalis* (c), *C. parapsilosis* (d), *C. glabrata* (e) and *C. kefyr* (f).

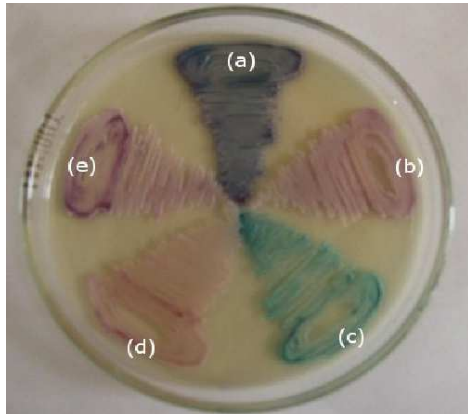


Figure 3. Colonies on CHROM agar : *C. tropicalis* (a), *C. krusei* (b), *C. albicans* (c), *C. parapsilosis* (d), and *C. glabrata* (e).

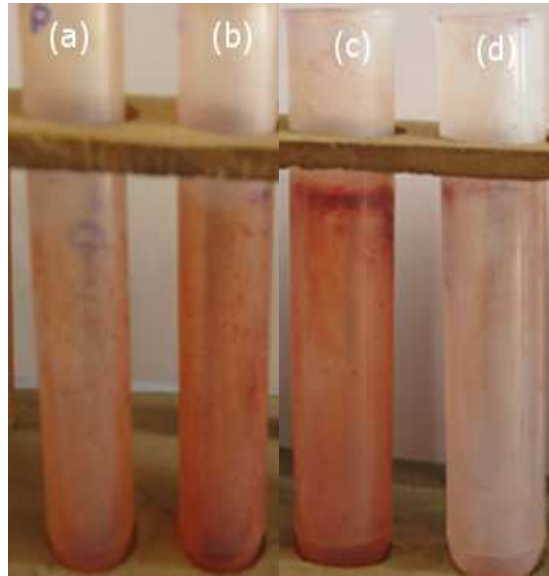


Figure 4. Biofilm positive 1+ (a), 2+ (b), 3+ (c) and biofilm negative (d)

Chart 1

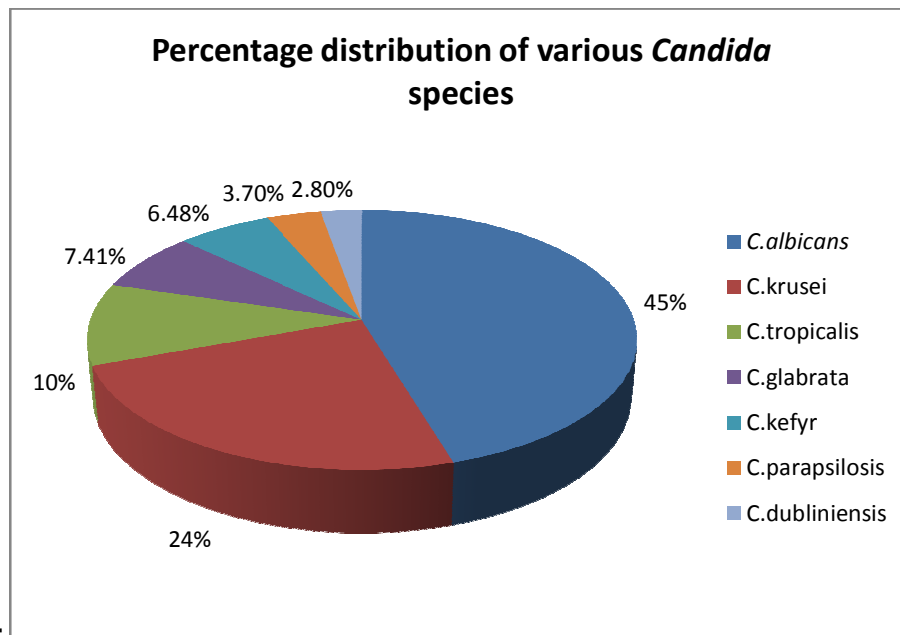


Chart 2

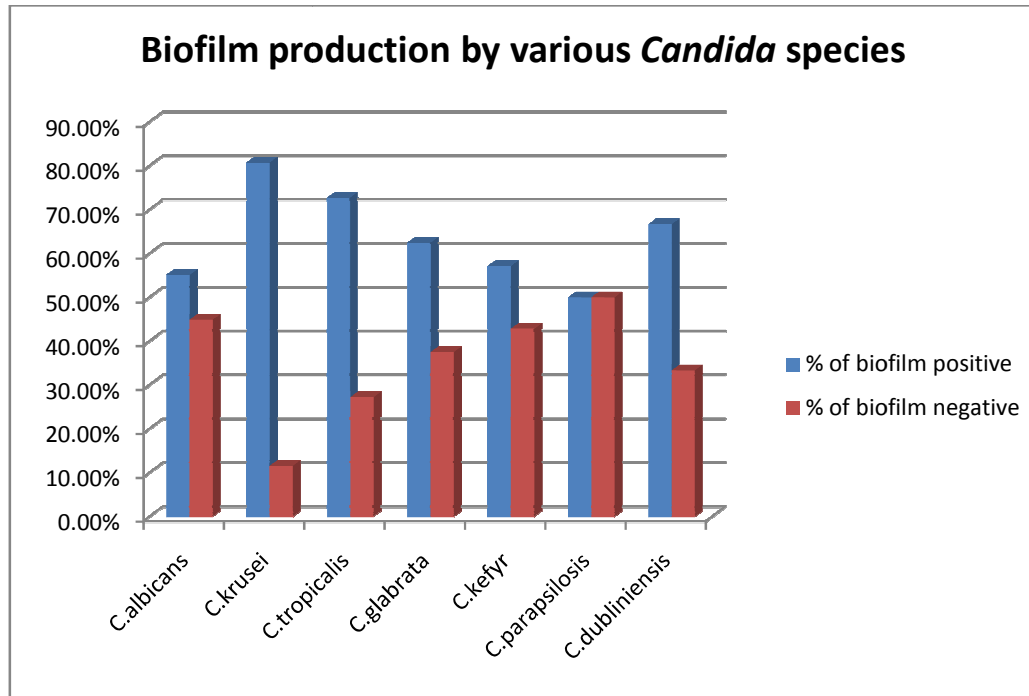
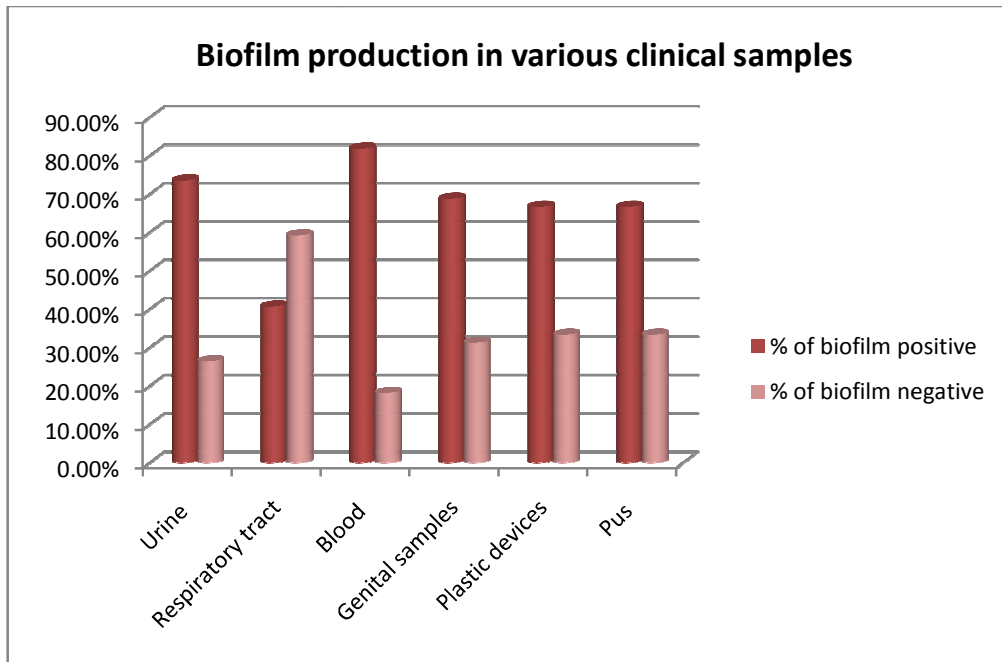


Chart 3



A STUDY ON THE MYCOLOGICAL PROFILE OF ONYCHOMYCOSIS

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ABSTRACT: BACKGROUND: Onychomycosis refers to fungal infection of nails with various etiological agents, involving dermatophytes, yeasts and moulds. It constitutes an important health problem because of its rising prevalence and under-diagnosis especially in developing countries. **AIMS:** To analyse the mycological and cultural characteristics of onychomycosis with respect to the various etiological agents. **SETTINGS AND DESIGN:** Nail samples collected from patients attending the dermatology clinic of Dr B.R Ambedkar medical college were processed in the microbiology department of Dr B.R Ambedkar medical college. **MATERIALS AND METHODS:** Nail clippings and subungual scrapings of patients with onychomycosis were subjected to KOH preparation. Culture was done on Sabouraud's dextrose agar medium and Sabouraud's dextrose agar with 5% chloramphenicol and cycloheximide. Species identification was done by colony characteristics, pigment production, slide culture and LPCB stain. **RESULTS:** Out of 98 cases, 73 showed the growth of fungus, amounting to 74.50% positivity. Among those 73 cases, the infective fungal agents predominantly were dermatophytes (54.80%), and the rest were due to yeasts (23.30%) and moulds(22%). Among the different species, *Trichophyton rubrum* (43.84%) accounted for the majority of dermatophytes; *Candida albicans* (16.44%) was the predominant yeast; and *Aspergillus niger* (16.44%) the commonest mould. The age group most commonly affected was 16-30yrs and males were commonly affected in our study. **CONCLUSION:** The present study highlights the need for microbiological confirmation in case of onychomycosis for appropriate management of onychomycosis cases and further epidemiological study.

KEY WORDS: Onychomycosis, Etiological agents, Dermatophytes, *Trichophyton rubrum*.

INTRODUCTION: The term onychomycosis is derived from the Greek word "onyx", a nail and "mykes" a fungus.¹ "Onychomycosis" traditionally referred to as nondermatophytic infection of nail is now used as a general term to denote any fungal nail infection.² It is defined as the fungal infection of nails caused by dermatophytes, yeasts and nondermatophyte moulds. It is one of the commonest nail disorders and accounts for upto 30% of all superficial fungal infections.³ This

may occur as a primary event or a secondary infection of a previously diseased or traumatized nail.⁴

Recently there has been a worldwide increase in the incidence of onychomycosis with social, cultural and economical factors contributing to it.³ In developing countries, higher priorities in socioeconomic concerns and health issues for other diseases, have resulted in low awareness of onychomycosis. Though there is a clearly diseased appearance associated with this condition, it is often regarded as merely a cosmetic problem of relatively minor importance.¹ Several factors implicated to the increase in disease are reduced peripheral circulation, diabetes, nail trauma and improper nail hygiene.⁵ Although not life threatening, onychomycosis may have significant clinical consequences such as secondary bacterial infection, chronicity, therapeutic difficulties and disfigurement in addition to serving as reservoir of infection.² Common clinical features include discoloration of the nail plate, hyperkeratosis and brittle nails.⁶

This infection can be caused by dermatophytes, yeasts and nondermatophyte moulds.⁷ Certain skin conditions such as psoriasis, lichen planus, onychogryphosis and nail trauma can mimic onychomycosis.⁶ Hence laboratory investigations are needed to differentiate accurately between fungal infections and the above mentioned skin diseases.

In India relatively less work has been done on onychomycosis as compared to western countries. The evolving role of nondermatophytic moulds has added a new dimension to the clinical patterns of onychomycosis.

The present study was conducted to study the morphological patterns and to analyse the mycological and cultural characteristics of onychomycosis with respect to various etiological agents in view of the paucity of literature on onychomycosis from this part of the country.

MATERIALS AND METHODS: This was a prospective study carried out on all clinically suspected cases of onychomycosis presenting to the dermatology clinic of Dr B.R. Ambedkar Medical College, Bangalore over a period of 6 months (may 2012 to October 2012) were included in the study.

SPECIMEN COLLECTION: Specimen collected were:- Nail and subungual scrapings from suspected cases of Onychomycosis.

First the affected area was cleaned with 70% ethanol. Nail and subungual scrapings were collected with a surgical blade and sent in sterile petri dishes to microbiology department. The samples were subjected to microscopic examination and culture. The nail samples were subjected to 20% potassium hydroxide (KOH) examination¹⁴ and the softened nail materials were examined under both low and high power of the microscope for the presence of fungal elements. The details regarding the hyphae, spores, budding cells and pseudo-hyphae were noted.

For culture all the samples were inoculated on:

- (1) Sabouraud's dextrose agar
- (2) Sabouraud's dextrose agar with 5% chloramphenicol and cycloheximide.

Cultures were incubated at 25^o C and 37^o C for 6 weeks and examined daily for the growth.

The identification of isolate from the growth was done on the basis of colony morphology and wet mount microscopy with lactophenol cotton blue stain and slide culture technique. The morphological characteristics of the colony such as colour of the colony, type of the growth

whether fluffy, cottony or creamy and the pigment produced on reverse were carefully observed and noted. For wet mount the material was taken from the growth with a wire loop and placed in a drop of lactophenol cotton blue stain on the glass slide. The material was evenly teased with a teasing needle known as 'spud needle' and observed under both low and high power of microscope. The details about the hyphae, the type of conidia and their arrangement were observed and recorded.⁸The dermatophytes and nondermatophytic moulds were confirmed by slide culture technique.

The following criteria were taken into consideration to consider nondermatophyte mould as pathogen:

- 1) A direct positive mycological examination presenting large and irregular septate hyphae
- 2) Growth of the same agent in pure culture in at least three tubes of SDA
- 3) No development of dermatophytes
- 4) Repetition of these criteria after an interval of 2 weeks.⁸

The candida spp were identified by gram stain, germ tube test, growth at 42°C and chrom agar.

RESULTS: A total of 98 patients (57 males and 41 females) were examined during the study period. Amongst these 98 patients with clinical manifestation in the nails, 58 (59.18%) had onychomycosis by direct microscopy and fungal cultures were positive in 73 specimens (74.45%).(table-3, chart-2).

The age of the patients varied from 6-75 years, majority (40.82%) i.e 40 out of 98 patients were between 16-30 years of age and the ratio of male to female was approximately 1.4:1 (table-1 & 2, chart-1)

The most frequently isolated fungus was dermatophytes in 40 (54.80%) patients followed by yeasts in 17 (23.30 %) patients, *Aspergillus* spp in 12 (16.44%) patients and *Fusarium* in 4 (5.50%) patients. Of the 40 dermatophytes isolated, *Trichophyton rubrum* was the most commonest, (figure-1 & 2) accounting for 32 (43.84%) cases of onychomycosis, followed by *Trichophyton mentagrophytes* 6 (8.22%) cases and *Trichophyton tonsurans* 2 (2.74%) cases. *Candida albicans* was the predominant yeast 12 (16.44%) cases followed by *Candida dubliniensis* 5 (6.84%) cases. *Aspergillus niger* was the commonest nondermatophytic mould in 12 (16.44%) cases, followed by *Fusarium* spp in 4 (5.50%) cases (table-4, chart-3)

The above data were analysed using Microsoft excel.

DISCUSSION: The importance of onychomycosis is often underestimated. Far more than being a simple cosmetic problem, infected nails serve as a chronic reservoir of infection which can give rise to repeated mycotic infections of the skin.

Onychomycosis occurs worldwide. Onychomycosis appears to be a variable entity presenting in different forms in different part of the world with every country and every region of the same country having its own characteristics of presentation.

In our study the isolation rate of onychomycosis was found to be 74.50%. Even studies from Sikkim and Turkey showed a higher isolation rate of 82.35% and 86.9% respectively (Martinez et al.,2009;⁸Kaur et al.,2007;)⁹

The commonest age group affected in our study was 16-30 yrs(40, 40.82%) followed by 31-45yrs(24, 24.49%). This was in concordance with studies done by Jesudanam et al.,2002¹⁰

and Reddy et al.,1982.¹¹ Higher isolation rate was noted among males (75.43%) than females, which was in concordance with most of the studies(Malik et al.,2009;⁶ ,Yehia et al.,2010;¹² Ahuja et al.,2011;)²

The most common isolate obtained in our study was *Trichophyton rubrum* (43.84%). It has been reported as most prevalent pathogen in onychomycosis by many studies (Ahmad et al.,2010;³Kaur et al.,2012;).¹³ The high rate of isolation of *T.rubrum* can be explained on the basis that it has greater capacity to infect the nails because it can easily colonise on hard keratin. Other dermatophytes isolated were *T. mentagrophytes* (8.22%) and *T.tonsurans* (2.74%).The second most common isolate in our study was *Candida* spp (22.30%) in which *Candida albicans* was most frequently reported (16.44%).The third most common isolate in our study was *Aspergillus niger* (16.44%). The other nondermatophytic mould isolated was *Fusarium*spp (5.50%).

In our study dermatophytes were the most common group followed by yeasts and then nondermatophyte moulds in the etiology of onychomycosis. *Trichophyton rubrum* was the most common isolate, followed by *Candida* spp and then *Aspergillus niger*.

Onychomycosis can no longer be considered a simple cosmetic problem confined to the nails. Even with apparently optimal diagnosis patients are not cured by current therapies owing to misidentification of the pathogen, presence of a second disorder, characteristics of the nails, presence of a high fungal inoculum and/or drug resistant microorganisms, compromised immune system of the host, diabetes mellitus or peripheral vascular disease.

The single area most deserving of our attention in the near future is that of improving diagnostic methods. Diagnostic methodology and fungal susceptibility testing lag behind therapeutic advances. We should turn our attention to these problems.

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Table 1

Age distribution in patients of onychomycosis

Age group (in years)	No of cases		Total	% age
	male	female		
05 - 15	09	06	15	15.31%
16 - 30	22	18	40	40.82%
31 - 45	13	11	24	24.49%
46 - 60	05	08	13	13.26%
61 - 75	04	02	06	06.12%

Table 2

Sex distribution in patients of onychomycosis

SEX	NO OF CASES	% AGE
Male	57	58.16%
Female	41	41.84%
Total	98	100%

Table 3

Direct microscopy (KOH preparation) vs fungal culture in the diagnosis of onychomycosis (n=98)

Diagnostic tests	KOH positive	KOH negative	Total
Fungal culture positive	47	26	73
Fungal culture negative	11	14	25
Total	58	40	98

ORIGINAL ARTICLE

Table 4 The different categories of fungi isolated from onychomycosis cases with their comparative percentage of occurrence

Type of fungi	No of positive cases (n= 73)	Percentage
Dermatophytes :		
T .rubrum	32	43.84%
T .mentagrophytes	06	08.22%
T .tonsurans	02	02.74%
Yeasts:		
Candida albicans	12	16.44%
Candida dubliniensis	05	06.84%
Nondermatophytic moulds:		
A.niger	12	16.44%
Fusariumspp	04	05.50%
Total :	73	100%

Table -5 Morphological and microscopic patterns of various isolates

Fungal isolates	Colony morphology	Microscopic identification
Dermatophytes		
LPCB stain		
T .rubrum	White downy colonies with rugal fold, reverse is wine red colour.	Tear drop shaped microconidia with few pencil shaped macroconidia
T .mentagrophytes	White granular and fluffy colonies, reverse is buff to reddish brown.	Grape like clusters of round microconidia with thin-walled, club shaped, multiseptate macroconidia.
T .tonsurans	White, wrinkled with heaped center, reverse yellow to tan.	Club shaped microconidia with flat bottoms, few balloon shaped macroconidia.
Yeasts		
Grams stain		
Candida albicans	Cream, smooth, pasty colonies	Gram positive budding yeast cells.
Candida dubliniensis	Cream, smooth, pasty colonies	Gram positive budding yeast cells.
Nondermatophytic moulds:		
LPCB stain		
A.niger	Wooly brown to black colonies, reverse white to yellow.	Conidiophore of variable length, biseriately phialides cover entire vesicle forming radiate head, conidia are black.
Fusariumspp	Fluffy to cottony colonies with orange pigment.	Multicelled sickle shaped macroconidia

Chart -1

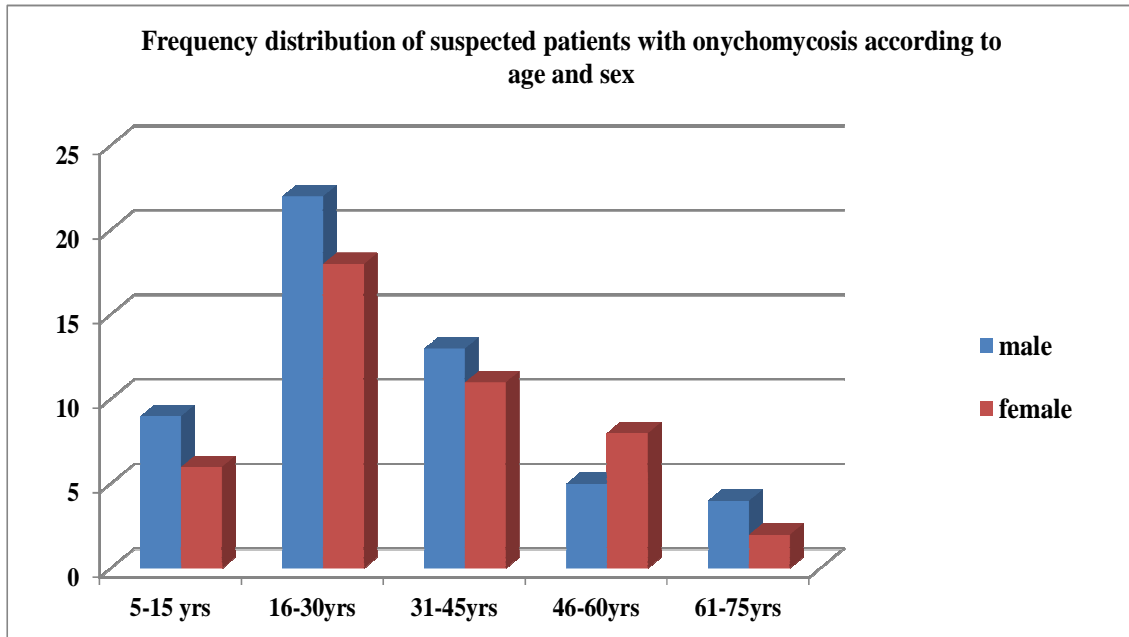


Chart -2

Direct microscopy vs fungal culture

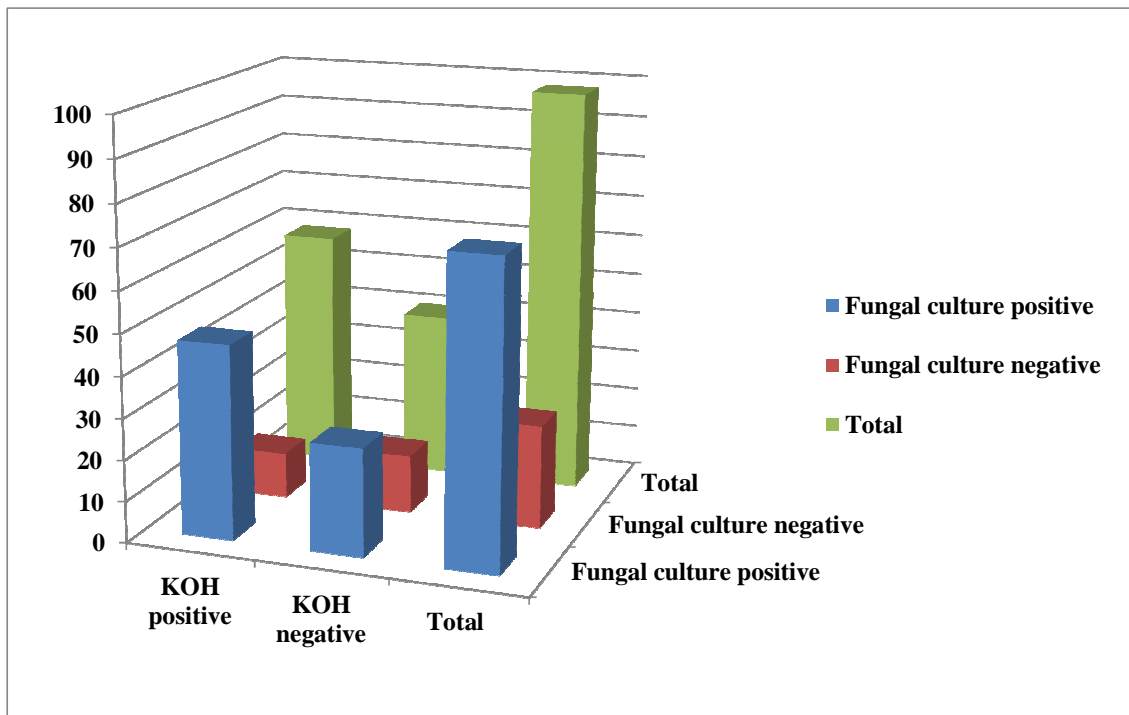
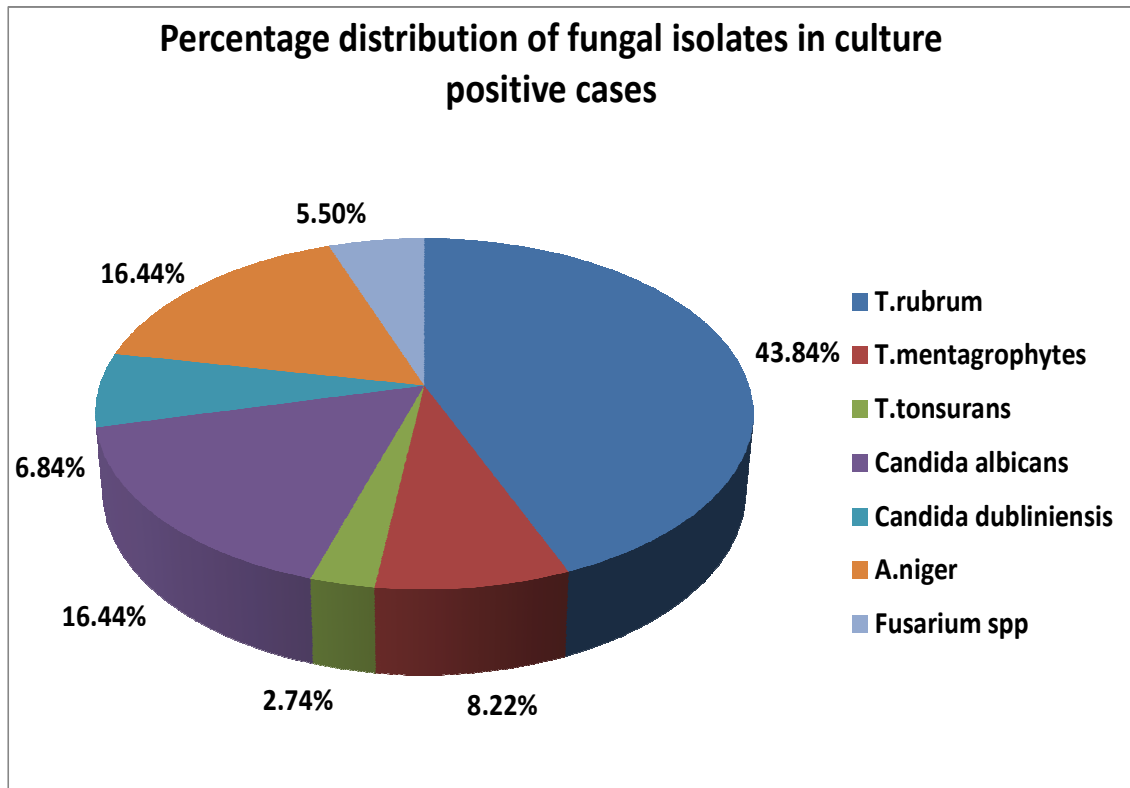
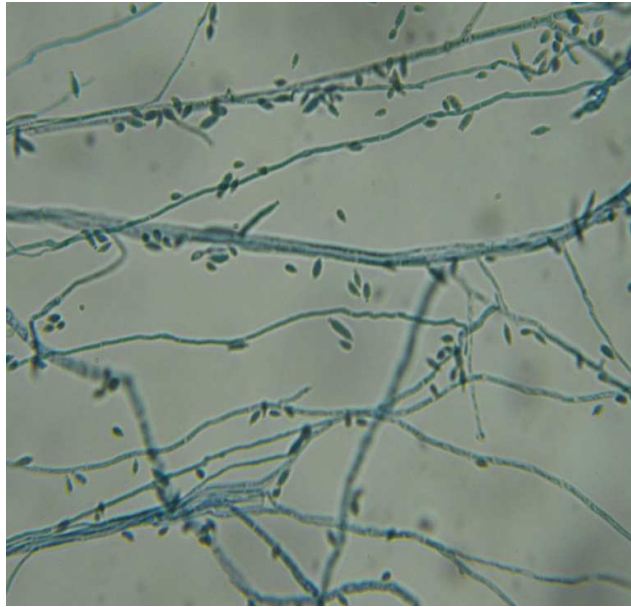


Chart-3



Colony morphology of Trichophytonrubrum

Figure -2



Microscopic morphology in lactophenol cotton blue stain -*Trichophytonrubrum*

GENDER DIFFERENCES IN EMOTIONAL INTELLIGENCE AMONG FIRST YEAR MEDICAL STUDENTS

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ABSTRACT: BACKGROUND: Emotions are our feelings; if properly used are essential tools for successful and fulfilling life. Emotional Intelligence (EI) is defined as “the composite set of capabilities that enable a person to manage himself / herself and others”. Six important facets of Emotional Intelligence are: self-awareness, self-confidence, self-control, empathy, motivation and social-competency. The stereotype of women being the more “emotional” sex survives to this day and women tend to have an edge over men when it comes to basic skills for a happy and successful life. **AIMS:** The objective of the study was to determine the gender differences in Emotional Intelligence among first year medical students. **SETTINGS & STUDY DESIGN:** The study included 150 first year medical students. Informed consent and ethical clearance was obtained. **METHODS:** Emotional Intelligence was assessed using emotional quotient self-assessment checklist to which subjects responded on five-point Likert scale. **RESULTS:** The mean scores of Emotional Intelligence in males and females were compared using unpaired students t-test. Emotional Intelligence was significantly high in females (105.34 ± 7.73) compared to males (102.06 ± 8.87) ($p = 0.02$). **CONCLUSION:** The reason might be due to the fact that women tend to be more emotionally expressive than men and understand emotions better. In addition, some evidence exists that certain areas of the brain dedicated to processing emotions could be larger in women than in men. Hence the present study may provide a better insight into individual’s emotional development and also psychoeducational intervention on individual’s emotional balance which might indirectly influence their success in career and family life.

KEY WORDS: Emotional Intelligence, First Year Medical Students, Gender Difference.

INTRODUCTION: Emotions are our feelings; if properly used are essential tools for successful and fulfilling life. But if emotions are out of control, it can result in disaster. In day-to-day life, they affect our relations with other people, our self-identity and our ability to complete a task. The famous psychologist E.L. Thorndike, through his concept of social intelligence, laid down a solid foundation of the essence of emotional intelligence (EI) in 1920. In modern times, the term EI was popularized by Goleman (1).

ORIGINAL ARTICLE

With the dawn of 21st century, the human mind added a new dimension which is now being held responsible more for success than intelligence. This is termed as Emotional Intelligence and is measured as EQ (Emotional Quotient). Emotional intelligence is defined as “the composite set of capabilities that enable a person to manage himself/ herself and others” (2).

COMPONENTS OF EMOTIONAL INTELLIGENCE: (3)

Six important facets of Emotional intelligence are: self-awareness, self-confidence, self-control, empathy, motivation and social-competency.

Self-awareness refers to an awareness of ourselves on many different levels: our body and our physical reactions; our emotions, preferences, and intentions; our goals and values; and our knowledge about how we come across to others. The more self-awareness we have, the more easily we can adjust our responses to others, and the more mutually satisfying our interactions and transactions.

Self-confidence is a positive and balanced attitude having to do with the Self dimension. It consists of a basic belief that we can do what is needed to produce the desired outcome. When obstacles occur, a person with a confident attitude continues to work to overcome the barriers. Overcoming barriers and giving ourselves credit for what we have achieved are important ways to build self-confidence.

Self-control is based on our having a positive self-attitude and enough self-knowledge to make the right decision about what to do with an emotion. The thinking brain can make decisions about emotions. Not all of them need to be expressed, but they also don't need to be hidden or denied. Emotionally intelligent people display feelings if they are relevant, and deal positively with emotions they can't show.

The first step toward skillful social behaviour is social knowledge or awareness. Such awareness or ability to tune in to others and feel what they are feeling is called empathy. Without empathy, we have difficulty sustaining relationships. People with high EQ have a number of strong relationships in all areas of their lives.

Emotion is the foundation for creativity, passion, optimism, drive, and transformation. Motivation is a synonym for enthusiasm, initiative, and persistence. A positive attitude in the social dimension is motivation, one of the key facets of Emotional Intelligence and of leadership. Appropriate behavior in the social dimension leads to Social Competency. To develop such social skills, we must focus on other people, rather than on what we are experiencing or want to say. If we are preoccupied, we will not be able to pay close enough attention to the other person in order to know how to respond appropriately.

It is believed that emotional intelligence plays a very important role in leadership, work life and career development. Intelligence Quotient predicts only about 20 percent of career successes, which leave the remaining 80 percent to other factors such as emotional intelligence (4).

EMOTIONAL INTELLIGENCE AND GENDER: The stereotype of women being the more “emotional” sex survives to this day and women tend to have an edge over men when it comes to basic skills for a happy and successful life (5).

Also women differ from men. For instance, if the other person is upset, or the emotions are disturbing, women's brains tend to stay with those feelings. But men's brains do something else: they sense the feelings for a moment, then tune out of the emotions and switch to other

brain areas that try to solve the problem that's creating the disturbance. Thus women's complaint that men are tuned out emotionally, and men's that women are too emotional—it's a brain difference (6).

Combining emotions with cognition would lead to a better day-to-day adaptation and conflict resolution by using not only our intellectual capacities but also the additional information provided by our moods (5).

With this background the present **preliminary study** has been undertaken to determine the gender differences in EI among first year medical students.

MATERIAL AND METHODS: This preliminary study was conducted in Department of Physiology, A.J.I.M.S, Mangalore with 150 first year medical students (89 females & 61 males) after obtaining their informed and written consent for the study. Ethical clearance was obtained from Institutional Ethical Clearance Committee. It is a cross-sectional, single interview study. Subjects included did not have any diagnosed medical or psychiatric illness as per history. EI was assessed using Emotional Quotient Self-Assessment Checklist (Table 1) devised by Sterrett (3). The questionnaire also included a section for age, gender and identifying information (College ID number).

Emotional Quotient Self-Assessment Checklist: It consists of 30 statements, five each for the areas for self-awareness, self-confidence, self-control, empathy, motivation and social-competency. This is a five- point Likert rating scale, ranging from 1 to 5; total score on each of 6 facets range from 5 to 25 and a cut -off value for good EI is 20 in each domain, the score below which needs improvement in the respective domain. Total score of EI including all the domains ranges from 30 to 180.

Scoring the Self-Assessment Checklist (Table 1):

1. The student is asked to enter ratings for each numbered question in the category where it appears.
2. Ratings are added for each category to obtain a total for that specific facet of EQ.

QUESTION NUMBERS FOR EACH DOMAIN:

Self-Awareness : 1, 7, 13, 19, 25

Self-confidence : 2, 8, 14, 20, 26

Self-control : 3, 9, 15, 21, 27

Empathy : 4, 10, 16, 22, 28

Motivation : 5, 11, 17, 23, 29

Social competency : 6, 12, 18, 24, 30

3. Total score of EI is obtained by adding the scores of all the domains of EI.

STATISTICAL ANALYSIS: The data were analysed by using SPSS version 17. Unpaired students 't'-test was computed to determine the significance of difference ($p < 0.05$) between males and females on Emotional Quotient Self-Assessment Checklist. Results are expressed as mean \pm standard deviation.

RESULTS: Table 2 reveals that majority of males, females and the total sample (males & females) had good EI (63.57%, 68.5% & 66.04% respectively) and percentage with regard to EI was high in females compared to males.

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Table 3 shows differences between mean scores of males and females in their emotional intelligence. EI was significantly more in females (105.37 ± 7.73) compared to males (102.06 ± 8.87) with p value of 0.02

DISCUSSION: The findings from this study among first year medical students showed significant difference in EI between males and females where in females had higher EI scores compared to males (Table 3). The obtained results are in line with the findings of previous studies (7, 8, 9, 10). They all found females to have higher emotional intelligence than that of males.

The reason for the present findings might be due to the fact that emotional intelligence primarily deals with managing and expressing one's emotions as well as social skills (10). It has been affirmed that women tend to be more emotionally expressive than men, that they understand emotions better and that they have a greater ability as regards certain interpersonal skills. Women for instance, recognize other people's emotions better, are more perceptive and have greater empathy (11). So their emotional intelligence ought to be higher than that of males. In addition, some evidence exists that certain areas of the brain dedicated to processing emotions could be larger in women than in men and that there is a difference in cerebral activity based on sex (5).

The relationship between the female sex and the emotional competencies are closely linked since childhood. Furthermore, the fact that girls develop verbal skills earlier than boys means they are more skilled at articulating their feelings and have greater expertise in the use of words. Hence, girls have more information about the emotional world and therefore speak more about emotional aspects and use more emotional terms than boys (12). All these traits help them to acquire more emotional intelligence as compared to boys.

The present study concluded that females had high EI compared to males. Understanding of this aspect may provide better insight into individual's emotional development and also psychological and educational intervention on individual's emotional balance which might indirectly influence their success in career and family life.

The limitations of the present study;

1. As this is a preliminary study, the paper was constrained in being limited to a single year's intake of students at one medical college. Further studies both in first year of their course (to establish whether this finding is strong) and in later years (to assess any effects of EI with regards to other course components and to later progress) is required.
2. Unequal distribution of sample- more female subjects.

ACKNOWLEDGEMENT:

The authors are thankful to the first year medical students who volunteered for the study.

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Table 1: Emotional Intelligence Self –Assessment Checklist.

Name:	Date:
Age:	
Sex: Female/Male	
College ID number:	

Rate each question below on a scale of 1–5, according to how true it is of you.

1	2	3	4	5
virtually never				virtually always

- 1) I am aware of the physical reactions (twinges, aches, sudden changes) that signal a “gut reaction.”
- 2) I readily admit mistakes and apologize.
- 3) I let go of problems, anger, or hurts from the past and I can move beyond these.
- 4) I generally have an accurate idea of how another person perceives me during a particular interaction.
- 5) I have several important things in my life that I am enthusiastic about, and I let it show.
- 6) I can easily meet and initiate conversation with new people when I have to.
- 7) I take a break or use another active method of increasing energy when I sense that

ORIGINAL ARTICLE

- my energy level is getting low.
- 8) I have little trouble taking prudent risks.
 - 9) I “open up” with people appropriately — not too much but enough so that I don’t come across as cold and distant.
 - 10) I can engage in an interaction with another and pretty well size-up that person’s mood based on non-verbal signals.
 - 11) Others usually feel inspired and encouraged after talking to me.
 - 12) I have no trouble making presentations in front of groups or conducting meetings.
 - 13) I take time every day for quiet reflection.
 - 14) I take initiative and move ahead on tasks that need to be done.
 - 15) I refrain from making up my mind on issues and expressing my opinion until I have all the facts.
 - 16) I have a number of people I can turn to, and I ask for their help when I need it.
 - 17) I try to find the positive in any given situation.
 - 18) I can deal calmly, sensitively, and proactively with the emotional displays of others.
 - 19) I can usually identify the emotion I am feeling at any given moment.
 - 20) I am generally comfortable in new situations.
 - 21) I neither bury my anger nor let it explode on others.
 - 22) I can show empathy and match my feelings with those of another person in an interaction.
 - 23) I can keep going on a big project, despite obstacles.
 - 24) I am respected and liked by others, even when they don’t agree with me.
 - 25) I am clear about my own goals and values.
 - 26) I express my views honestly and thoughtfully, without being pushy.
 - 27) I am good at managing my moods, and I seldom bring negative emotions to work.
 - 28) I focus my full attention on another person when I listen to them.
 - 29) I believe the work I do day-to-day has meaning and value to society.
 - 30) I can effectively persuade others to adopt my point of view without coercing them.

Table 2: Percentage distribution in males, females and total sample.

(N=150, males=61, females=89)

Variable	Category (Mean score in Each domain)	Males (%)	Females (%)	Total (%)
EI	≥20 (Good)	63.57	68.5	66.04
	<20 (Low)	36.43	31.5	33.96

EI: Emotional Intelligence

?: Percentage

ORIGINAL ARTICLE

Table 3: Mean scores of EI in males and females.

(N=150, males=61, females=89)

Variable	Gender	Mean	Standard Deviation	Standard Error Mean	t- value	Sig. (2-tailed)
EI	Male	102.06	8.87	1.136	2.359	0.02*
	Female	105.34	7.73	0.819		

* p value <0.05.

EI: Emotional Intelligence.

CASE REPORT

COST EFFECTIVE PRE-FABRICATED SEMI-PRECISION ATTACHED OVERDENTURE - A CASE REPORT

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ABSTRACT: Considering the newer advances in the field of prosthodontics the use of implant has become popular. However not every patient can go for such procedures considering the economic norms and lack of awareness as well. A conventional concept of preventive prosthodontics has been emphasizing on the importance of any procedures that can delay or eliminate future prosthodontic problems. In a recent study, post insertion of denture, most patients with removable partial or complete dentures were dissatisfied with their retention and stability. Considering this overall scenario when a patient with completely edentulous maxillary arch and partially edentulous mandibular arch reported to the mentioned institution, a semi-precision attached overdenture were thought of, which in turn could show considerable advantages like increased retention, proprioception, and masticatory efficacy. A Prosthodontist who is well acquainted with semi-precision attachment will be in position to suggest a better treatment options in retaining teeth which might otherwise be considered for extraction or immediate implant placement.

KEY WORDS: attachment, overdenture, pre-fabricated, semi-precision, tooth-supported

INTRODUCTION: A primary reason for dental treatment is to restore oral function especially mastication, bite force shows positive relationship with masticatory performance and dietary selection. Most common debilitating oral condition existing on a routine level is edentulism, especially in mandible.¹ Earlier when the patient used to come as candidates for denture with their weak worn-out teeth, were advised for total extraction and followed by replacement with conventional complete dentures.

However, it remains one of the more challenging procedures in the dental practice to fabricate a complete mandibular denture offering patient comfort, function and esthetic harmony with retention and stability.² "Its more important to preserve what already exists than to replace what is missing" as stated by MM De Van has never been questioned or disagreed. Considering this the preservation of one or more teeth/roots to facilitate an overdenture has many advantages, including preservation of alveolar bone overtime.³ Other advantages like increased stability and efficiency of function and maintenance of proprioception are of great benefit to the patients.⁴

CASE REPORT

For overdentures a lot of auxiliary retentive attachments to anchor prosthesis and increase or provide retention have been promoted. However the most common and simplest being the retention offered mechanically by the means of O-ring and a ball. This comprises mainly of a root supported component (usually metallic) and a corresponding component (usually nylon, plastic or rubber) luted into the intaglio of the prosthesis.⁵

To use the commercially available precision attachment is a costlier affair when practicing in rural setup. So we came up with the concept of fabricating semi-precision attachments. The attachments were fabricated using the conventional lost wax technique for casting. The intra radicular portion was made using the pattern resin while, the coronal portion was made using the plastic bead and pattern resin. These two halves were joint using the pattern resin forming one single unit. This was invested and casted conventionally. These attachments were fabricated in the institute itself and later were used in the patient. This not only served the purposed but also reduced the patients visit and the cost of the treatment. This case report explores the treatment of a patient with prefabricated semi-precision retained overdenture.

CASE REPORT: Patient reported to the Department of prosthodontics with a chief complaint of difficulty in mastication. On examination maxillary arch was completely edentulous. The mandibular arch was partially edentulous and was Kennedy class I modification 1. The teeth present were 34,35 and 44,45 (figure.1). The teeth present were periodontally sound. The patient was dissatisfied by the previous ill fitting removable partial dentures. The patient was informed with all the possible treatment options from fixed implant treatment to conventional complete dentures. After a careful consideration the treatment mutually agreed was to have a overdenture with semi-precision attachments. An informed consent was then obtained from the patient.

PROCEDURE: Diagnostic impressions were made using impression compound for the maxillary arch and irreversible hydrocollide for mandibular arch. Post space was made to use approximate size of the extra coronal attachment. Canals can be prepared using passo reamers of 4,5,6 sizes corresponding to the sizes of extra coronal attachment (figure.2). Passo reamer of size 4 was finalized for this case. Obturated root canals were explored with passo reamers in a sequential manner on premolars bilaterally to remove gutta percha 4mm short of the apical foramen. After achieving adequate post space on mandibular premolars bilaterally, the prefabricated semiprecision attachments were inserted individually into each canal for checking the parallelism and fit. These attachments were then cemented on both mandibular premolars bilaterally using glass inomer cement (figure.3). Following custom tray were fabricated using self cured acrylic resins, border moulding for maxillary arch was made using the low fusing green-stick material while the border moulding for mandibular arch were done using putty, final impressions for maxillary arch was made using zinc oxide eugenol paste while the final impression for mandibular arch were made using medium bodied additional silicone. Record bases were fabricated. Then occlusal wax rims were prepared after which the casts were mounted on a semiadjustable articulator, teeth arrangement and further try-in procedures were carried out. The maxillary and mandibular dentures were processed using the conventional methods of processing. Bilaterally the intaglio surface of mandibular denture near premolar region was relived using carbide burs to incorporate female component. The female component was fabricated using the self cure acrylic resin and orthodontic elastic module acting as an elastic O-ring. This was later incorporated in the intaglio surface of the denture base (figure.4).

CASE REPORT

The finished and polished dentures were then inserted in the patient's mouth providing support and proprioception (figure.5).

DISCUSSION: Prothero 1916, gave the earliest references to use the roots for providing support.⁶ The overdenture provides a series of advantages over the conventional complete denture like preservation of bone, increased retention and stability and proprioception.^{7,8}

In this case the retained teeth were the premolars. The premolars form the most ideal location for an overdenture abutment as they are link between the occluding molars and incising incisors, thus they serve the purpose. Also as the teeth were prepared to the gingival level, the lost height of the coronal portion itself provided the space for the overdenture attachment. The added advantage of stud type of attachment is that they were low profile, Easy hygiene maintenance and enhanced crown/root ratio.

Considering the cost factor as a major issue in rural set up the patient should not be denied of the possible treatment option. Hence this system was initiated of low cost prefabricated semi-precision overdenture attachments as the overdentures are a superior health service compared to the conventional complete dentures.¹

CONCLUSION: Preventive prosthodontics being the rationale, preservation of the existing teeth and extending an alternative to conventional dentures by the use of tooth supported overdentures would be the most plausible choice in the long run. It is reasonable to say that retention of a part of natural dentition affords the overdenture patient a gain in the neuro-muscular performance, thereby giving him an edge over his edentulous counterpart. Careful case and abutment selection, patient motivation and periodic recall are the keys to successful prosthetic rehabilitation. This case report describes a simplified technique for improving overall prognosis, especially in mandibular overdenture using the pre-fabricated semiprecision attachment thereby minimizing the patient visit, and most importantly making this treatment available to low socio-economic category people, thus being helpful in rural areas where people opt for second line of treatment options just due to cost factor.

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CASE REPORT



figure.1 Partially edentulous mandibular arch



figure.2 Prefabricated Semi precision overdenture attachments



figure.3 Cemented Semi precision attachments



figure.4 Female components incorporated in the intaglio surface of mandibular denture



figure.5 Denture providing support and proprioception