

CLINICO-PATHOLOGICAL STUDY OF EXTRACRANIAL COMPLICATIONS OF MIDDLE EAR INFECTIONSSitashree Sethy¹, Krishna Chandra Mallik²**HOW TO CITE THIS ARTICLE:**

Sitashree Sethy, Krishna Chandra Mallik. "Clinico-Pathological Study of Extracranial Complications of Middle Ear Infections". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 13, March 31; Page: 3460-3467, DOI: 10.14260/jemds/2014/2306

ABSTRACT: Suppurative otitis media is a common occurrence and so are its complications. Its various complications are of frequent occurrence in otorhinolaryngology clinics. The incidence of extracranial ones are still posing a problem to the otologists Present work has been, undertaken from September 2010 to September 2012 to study the incidence of extracranial complications in relation to suppurative otitis media and to study the clinical presentation and pathology of extracranial complications of suppurative otitis media. Total 6130 cases of suppurative otitis media were observed (23.96%). Out of these patients 4890 cases (19.11%) were having chronic suppurative otitis media (CSOM) and 1240 cases (4.85%) had acute suppurative otitis medi (ASOM). In the present study, it is seen that 23.96% of total patients were having suppurative otitis media. The incidence of complications due to ASOM is 1.45%. Mastoiditis comprises of 59.35% of total extracranial complications and is the commonest in the present series followed by subperiosteal abscess, labyrinthitis and facial palsy. The prevalence can be decreased by means of health awareness regarding how to take care of the ear and when to report the physician.

KEYWORDS: Extracranial Complications, Middle ear infections, Clinicopathological study.

INTRODUCTION: Suppurative otitis media is a common occurrence and so are its complications. The growing children are the worst sufferers of complications. Though the incidence of intracranial complications has appreciably reduced, the incidence of extracranial ones is still posing a problem to the otologists. Infections of middle ear cleft are very common in India. 40% of attendance in E.N.T. department of general hospitals consists of cases of infections of middle ear cleft. Contribution towards the treatment of this malady has yet to be achieved to a standard, in developing countries. India being a subcontinent where 80% of the population live in rural areas in the altar of poverty, ignorance, and illiteracy and lag behind in facilities of transport and early specialist advice.

Thus patients attend outdoor chiefly with complications of suppurative otitis media. Further the indiscriminate use of antibiotics and ear drops have produced resistance strains of bacteria, the treatment of suppurative otitis media and its complications have undergone a revolutionary change in the hands of otologist. The ultimate aim of the otologist is to have an ear dry, socially useful and safe from the threatening complications. The present work has been designed to stress upon the clinico-pathological evaluation of extracranial complications of middle ear infections amongst the patients attending E.N.T. department of V.S.S. Medical College Hospital, Burla which is the tertiary apex hospital in whole of the western Odisha for specialized consultations so that we can predict the eventuality and also create the awareness among the public to prevent the complications.

AIMS AND OBJECTIVES: The present study is planned to (a) study the incidence, clinical presentation and pathology of extracranial complications of suppurative otitis media. (b) make a

ORIGINAL ARTICLE

comparative study of different extracranial complications of suppurative otitis media relating to their incidence. (c) Study the incidence relating to age and sex, socio-economic-status, rural and urban distribution seasonal variations and bathing habits.

MATERIALS ANDMETHODS: Present work has been, undertaken in the department of otorhinolaryngology of V.S.S Medical College, Burla, Odisha, from September 2010 to September 2012. All cases of clinically diagnosed chronic and acute suppurative otitis media attending the E.N.T outdoor and those admitted to indoor with complications were taken into consideration. Hospital records were studied and the statistical data were collected for (a) Total no. of new E.N.T cases registered in out-patient department (O.P.D) with different ailments. (b) Total no. of CSOM and ASOM cases. (c) Total no. of CSOM cases with complications. (d) Total no. of ASOM cases with complications. The patients with tubercular otitis media and suppurative otitis media in association with external or middle ear malignancies were excluded from the study.

The patients were examined in detail and the records were maintained as per prescribed proforma set before the study to be started. Then required investigations pertaining to the study were carried out, such as the following routine blood, stool and urine tests including Sickling test and Special investigations like Aural swab for culture & sensitivity test, Pure Tone Audiometry, X- Ray mastoid both side, CT Scanning of skull and brain, MRI when required and Histopathological study in selected cases from tissue obtained at surgical exploration.

OBSERVATIO AND DISCUSSIONS: Total 25580 patients attended the E.N.T. O.P.D. during the period of observation. Total 6130 cases of suppurative otitis media were observed (23.96%). Out of these patients 4890 cases (19.11%) were having CSOM and 1240 cases (4.85%) had ASOM. In the present study, it is seen that 23.96% of total patients were having suppurative otitis media, which can be compared with that of Amit K. Verma et al ¹ who in their study of 613 children, found CSOM in 94 cases. The incidence of CSOM in this study was 15.3%. Browing GG et al ² found the total prevalence of chronic otitis media to be 16%.

The present study shows 286 (5.84%) cases having various complications due to CSOM and 18(1.45%) cases having various complications due to ASOM (Table-I). This is comparable to that of Kangansarak et al ³ who in their study of 17,44 cases of CSOM reported incidence of complications of CSOM range from 6.45%-7.5%. Palva et al ⁴ in a study of 191 patients of CSOM, found complications in 8 cases (4.2%).

The incidence of complications due to ASOM is 1.45% is comparable to that of P.T. Wakode et al ⁵ who in their study of 4104 school going children, age ranging from 3-15 years for duration of 1 year, found the incidence of complications of acute otitis media to be 1.3%. The maximum number of patients with CSOM and its complications are of less than 10 years. Total 2348 cases were found in this age group, comprising 48.01% of total number of CSOM cases. In this study the incidence of cases as well as complications shows a declining trend with increase in age. This can be compared with the study of OO Olubanjo⁶ who found maximum incidence of suppurative otitis media in <6 yrs age group and Bluestone et al.⁷ found majority of CSOM patients belonged to 2-11 yrs age group (25.83%) and Ahmed M. Alabbasi⁸ in his study found maximum population of CSOM patients belonged to 2-11 year age group.

ORIGINAL ARTICLE

The maximum incidence of ASOM and its complications is in the first decade followed by second decade (88.8%). Tos M⁹ in which he recorded incidence of ASOM to be 49% in the first decade. Bluestopne C.D.⁷ had a similar view.

It is observed that the incidence of CSOM cases and its complications are more in male sex (66.33%) than in females (33.16%). The ratio of male to female is 2.5:1 for CSOM cases, 2.6:1 and 2.3:1 for extracranial (72.35%:27.64%) and intracranial cases (70%:30%) respectively. Ahmed M Alabbais⁸ in his study found male preponderance of CSOM cases i.e.54.16%. But it differs with the findings of OO Olubanjo⁶ reported female preponderance in his study. In his study he found, out of 104 cases of CSOM 55 (52.9%) were females. This series also showed the male preponderance for ASOM cases as well as for its complication. The present study does not agree with that of P.T. Wakode et al⁵. In their study out of 123 cases of ASOM, 71(57.72%) were females. More no of suppurative otitis media cases and its complications reported in male may be explained by following factors; a) The attendance of male, in the OPD is higher than females; b) Male are more prone to infections as they take up more of outdoor activities exposing themselves to changing environment; c) Male children given priority over their female siblings by parents; d) General hesitant nature of women to seek medical advice for small thing like discharging ear.

In the present study, the maximum patients of suppurative otitis media (SOM) were found in the rainy season (45.87%) followed by winter (29.93%) & spring season(22.56%). The high incidence in rainy season is because of probability of contamination of ear with preformed perforation with water and increase frequency of upper respiratory tract infection in rainy season.

In the present study, 62.45% of CSOM patients belong to rural population and 37.54% of CSOM were from urban population. This matches with study of OO Olubanjo⁶ in which maximum population were from rural area. In his study of 104 cases of CSOM, 78 lived in poorly ventilated house. This higher prevalence in rural population is due to lack of education, lack of understanding to know the seriousness of health conditions and frequent treatment by untrained personnel, while the urbanities have the advantage of getting treatment by specialists with proper antibiotic usage resulting in arrest of disease process.

The preponderance of CSOM and its complications are highest among the patients of lower socio economic status 79.14% in CSOM and 67.48% in complicated cases followed by middle socio economic status. Incidence is quite low in high socio economic status. This is comparable to that of Browning GG et al² They found higher prevalence of CSOM in lower socio economic groups with manual workers. P.T. Wakode et al ⁵ found 96 patients out of 123 cases were from families of low socio economic status. S. K. Chadha et al ¹⁰ in their study, found prevalence to the 19.6% in school children of slum areas, family belonged to low socioeconomic status while the same in children of higher socioeconomic status was 2.13%. P. Adhikari et al (2007)¹¹. In their study, noted higher prevalence of CSOM i.e. 5.7% in children of the government school & 4.8% in children of the private school. This difference may be due to different socioeconomic status.

Out of 286 cases of various complications, 40 cases were intracranial. Rest 246 complications were extra cranial, which comprises of 5.03% of total CSOM & 86.01% of total complications. The above result is comparable to that of Leskinsen K et al.¹² In their study of 50 cases of CSOM, 41 (82%) had intra temporal and 9(18%) had intracranial complications. it is evident from the present series that extracranial complications out number intracranial complication; which is comparable to Leskinen K et al.¹² The same pattern is observed in ASOM cases & its complications. Leskinen K, Jero

ORIGINAL ARTICLE

J¹² in their retrospective study of 33 pediatric patients with complications of AOM, aged from 3 months 14.2 years, found intra temporal (32 cases) and intracranial (1 case) complication. It is evident that mastoiditis comprises of 59.35% of total extracranial complications and is the commonest in the present series followed by subperiosteal abscess, labyrinthitis and facial palsy.

This is comparable to that of Siba P Dubey et al¹³ who found commonest extracranial complications were mainly mastoid abscess in 26 (37%), post auricular fistula in 17(24%) and facial palsy in 10(14%) cases. Incidence of facial palsy in the present study is 9.58% which is comparable to the incidence rate of other studies The subperiosteal abscess has the highest incidence i.e. 56.25% followed by mastoiditis. Goldstein NA et al¹⁴ reviewed their experience with 100 children between 1980 and 1995 with intratemporal complication of acute otitis media. 72 patients had acute mastoiditis. Maximum patients reporting to OPD of VSS medical college were from remote areas and they came in a neglected state after taking inadequate treatment. So, in this study incidence of subperiosteal abscess is higher i.e. 56.25%. Otorrhoea was seen in 93.29% of CSOM cases and 100% patients with extracranial complication and intracranial complication. This finding matches with studies of Ahmed M. Albbasi⁸. He reported otorrhoea in 100% cases. Deafness constituted 53.53% cases of total CSOM cases and comparable with that of Amit K. Verma et al¹ In their study out of 603 children 94 had CSOM, out of that 58 (61.7%) had hearing impairment. Deafness is present in 74.12% of extracranial complications and 88.33% of intracranial complications. Anoop Raj & Ramanuj Bansal¹⁵ studied hearing loss in rural population, and they concluded that otitis media is the commonest etiological factor i.e. 57.25%. In this present study otalgia has been noted in 53.65% of having extracranial complications. Fever occurred in 33.33% with extracranial complication.

The incidence of conductive, mixed hearing loss in CSOM cases is found to be 60.35%, 39.65% respectively. This is comparable to finding of Ahmed M. Alabbasi et al⁸ In the study of 120 cases of CSOM, they found conductive hearing loss in 55.5% cases, mixed hearing loss in 44.3% cases and sensory neural in 16.6% cases. Ramanuj Bansal¹⁵ in a study of 758 cases, found otitis media (57.25%) is the commonest cause and conductive hearing loss (86.17%) in otitis media is the commonest type. B. M. Minja¹⁶ in a study of 189 cases of CSOM found the prevalence of hearing loss in CSOM was 89 (47%). Out of that conductive hearing loss was seen in 73(82%) and sensorineural (SNHL) was seen in 16 (18%) cases.

The incidence of conductive, mixed and sensory neural hearing loss in ASOM cases is found to be 78.22%, 19.17% and 2.09%, respectively. The same in the complications of ASOM is found to be 72.22%, 16.66% and 11.11% respectively.

The attic perforation occurred maximally (55.24%) in all complicated cases followed by posterior-superior (19.58%), central perforation (17.48%) and total perforation (7.69%).

The study of mastoid in radiologic investigation in Laws's / Schuller's lateral oblique views showed that most of the ears with complications have sclerotic mastoid i.e. in 79.03% cases followed by Cellular mastoid in 9.79% and Diploic mastoid is seen in 11.18%. HRCT finding of brain with special reference to temporal bone showed cholesteatoma in 51.74 cases followed by ossicular chain involvement in 23.07% cases. Out of 25 cases of facial palsy, only 9 cases had facial canal dehiscence in CT finding. Diagnosis of the entire intracranial abscess was done on the basis of CT scan finding. These findings were correlated with intra operative findings. Bacteriological study showed that *Pseudomonas aeruginosa* 114(43.51%) is the most frequent organism, followed by *Staphylococcus aureus* 78(27.27%) followed by *proteus* 35(13.35%) this coincides with the finding of Kamran Iqbal

ORIGINAL ARTICLE

et al¹⁷ i.e. *P. aeruginosa* 45.9%, *Staphylococcus aureus* 26.4%. and of Shymala R. et al¹⁸ incidence of *P. aeruginosa* is the most prominent organism causing complication of CSOM i.e. 40% of the cases followed by *staphylococcus aureus* 31%.

CONCLUSION: Suppurative otitis media is frequently seen in people of low socioeconomic status. This percentage is little higher in rural population i.e. 37% while in urban population it's 32% according to the planning commission of India (1994). Children are more susceptible because of obvious factors. In India 50% of its population are less than 25 years of age. The incidence of CSOM in India has increased in the past two decades due to various factors, like increased population and its consequences. Besides this general health, diet, overcrowding, low education (indicators low Socio-economy status) are major determinants in etiopathogenesis of CSOM. The prevalence can be decreased by means of health awareness regarding how to take care of the ear and when to report the physician.

REFERENCES:

1. Amit K. Verma et al. Epidemiology of chronic suppurative otitis media and deafness in a rural area and developing an intervention strategy. *Indian J Pediatr.* 1995 Nov- Dec;62(6):725-9.
2. Browning GG, Gatehouse S. The prevalence of middle ear disease in the adult British population. *Clin Otolaryngol Allied Sci.* 1992 Aug;17(4):317-21.
3. Kangsanarak J, Fooanant S, Ruckphaopunt K, Navacharoen N, Teotrakul S. Extracranial and intracranial complications of suppurative otitis media. Report of 102 cases. *J Laryngol Otol* 1993; 107, 999-1004.
4. Palva T, Virtamen H, Marine J. Acute and latent mastoiditis in children. *J Laryngol Otol* 1985 Feb; 99(2): 127-36
5. P. T. Wakode, S. V. Joshi, S. H. Gawarle. Chronic suppurative otitis media in school going children. *Indian J Otolaryngol Head Neck Surg.* Apr 2006; 58(2): 152-155. doi: 10.1007/BF03050772.
6. O OOlubanjo. Epidemiology of acute suppurative otitis media in Nigerian children: The internet scientific publication. *The internet Jour of Paed& Neonatology:* 8:1: Nov 2008: 44-56.
7. Bluestone CD, Klein JO. Intracranial suppurative complications of Otitis media and mastoiditis. In: Bluestone CD, Stool SE, Scheetz MD, eds. *Pediatric Otolaryngology*, 2ndedn. Philadelphia: WB. Saunders, 1990:537-46.
8. Ahmed M. Alabbasi, Ihsan E. Alsaimary, Jassim M Najim. Prevalence and patterns of Chronic suppurative otitis media and hearing impairment in Basrah city. *Journal of Medicine and Medical sciences* 2010; 1(4):129-133.
9. Tos M. Incidence, aetiology and pathogenesis of cholesteatoma in childhood. *ill: Pfaltzc.R. Advances in oto-rhino-laryngology.* 40: *Pediatric Otology.* Basel: Karger, 1988; 110 - 17.
10. S. K. Chadha. A comparative evaluation of ear diseases in children of higher versus lower socioeconomic status. *The Jour Laryngology & Otology:* 120: 1: [un] 2005: 16 -19.
11. P Adhikari et al. Prevalence of chronic suppurative otitis media in school children of Kathmandu district. *Journal of Institute of Medicine* Vol 29, No 3 (2007)
12. Leskinen K. et al. Acute complications of otitis media in adults. *Pubmedline: Clin Otolaryngol.* 2005; 30(6): Dec 2005: 511 - 516.

ORIGINAL ARTICLE

13. Siba P. Dubey et al. Complications of chronic suppurative otitis media and their management. The laryngoscope: 117: 2: Feb 2007: 264 - 267.
14. Goldstein NA et al. Intratemporal complication of acute otitis media in infants and children. Jour Otolary & HNS: 119: 5: Nov 1998: 444 - 54.
15. Ramanuj Bansal and Anoop Raj. Hearing loss in rural population: The etiology. Indian J Otolaryngol Head Neck Surg. 1998 April; 50(2): 147-155.
16. Minja BM, Machemba A. Prevalence of otitis media, hearing impairment and cerumen impaction among school children in rural and urban Dares Salam, TanZania. Int J Pediatr Otorhinolaryngol 1996; 37:29-34
17. Kamran Iqbal et al. Microbiology of chronic suppurative otitis media: experience at deraismail khan. Gomal Journal of Medical Sciences July-December 2011, Vol. 9, No. 2
18. Shyamala R, Reddy PS. The study of bacteriological agents of chronic suppurative otitis media: Aerobic culture and evaluation. J Microbiol biotech Res 2012; 2:152-62.

Age in yrs.	No. of CSOM	%	No. of Total Complications	% of complication
< 10 years	2348	48.01%	98	34.26%
11 - 20	890	18.20%	64	22.37%
21 - 30	588	12.02%	55	19.23%
31 - 40	542	11.08%	54	18.88%
41 - 50	296	6.05%	06	2.09%
51 - 60	158	3.23%	06	2.09%
> 60 yrs	68	1.39%	03	1.04%

Table I: Showing the age wise distribution of CSOM and its complications

Age in years	No. of ASOM cases	% to total ASOM	No. of total Complications	% of complication
Up to 10 yrs.	886	71.45	14	77.77
11 - 20	206	16.61	02	11.11
21 - 30	78	6.29	00	00
31 - 40	58	4.67	01	5.55
41 - 50	12	0.96	01	5.55

Table II: Showing the age wise distribution of ASOM and its complications

Name of Complications	No. of cases	% out of Extracranial complications	% out of Total CSOM cases
Mastoiditis	146	59.35%	2.98%
Subperiosteal abscess	49	19.92%	1.002%
Facial palsy	28	11.38%	0.57%
Labrynthitis	23	9.35%	0.47%

Table III: Showing Incidence of Individual extracranial complications of CSOM

ORIGINAL ARTICLE

No. of cases	No of cases of individual complications	% of complications
ASOM - 1240	Mastoiditis - 4	25%
Complications - 18	Subperiosteal abscess - 9	56.25%
Extracranial - 16	Facial palsy - 2	12.5%
Intracranial - 2	Labrynthitis - 1	6.25%
	Meningitis - 1	100%

Table IV: Showing incidence of individual extracranial and intracranial complications of ASOM

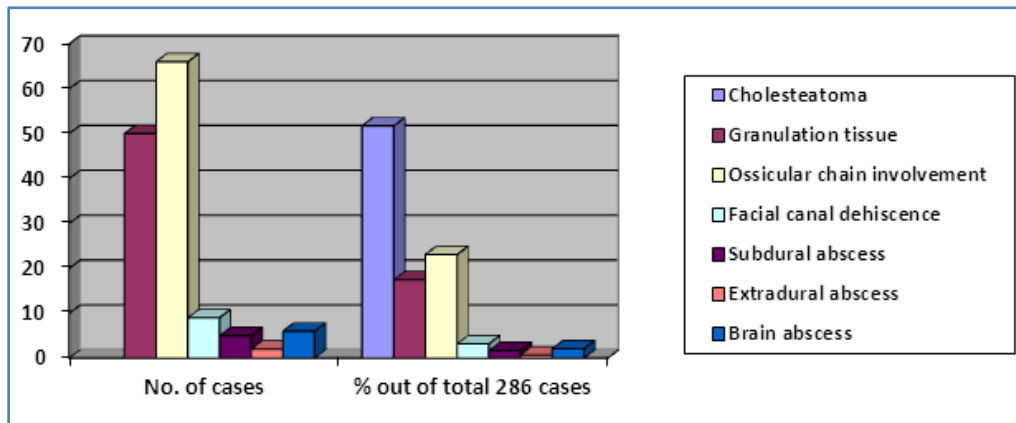


FIG.I: Incidence of complications

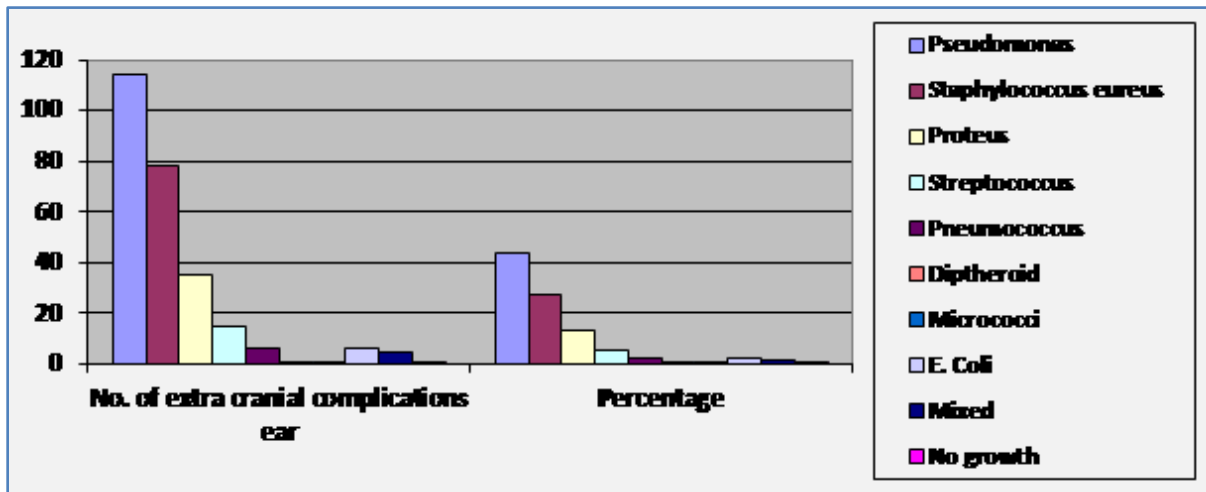


FIG.II: Microbiological incidence

AUTHORS:

1. Sitashree Sethy
2. Krishna Chandra Mallik

PARTICULARS OF CONTRIBUTORS:

1. Post Graduate Resident, Department of Otorhinolaryngology, VSS Medical College, Burla, Sambalpur, Odisha.
2. Associate Professor, Department of Otorhinolaryngology, VSS Medical College, Burla, Sambalpur, Odisha.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Sitashree Sethy,
C/o – Dr. K. C. Mallik,
Plot No. 1195/C-27,
Sector 6, CDA Market Nagar,
Cuttack – 753014, Odisha.
E-mail: drsitashree@gmail.com

Date of Submission: 06/02/2014.

Date of Peer Review: 07/02/2014.

Date of Acceptance: 24/02/2014.

Date of Publishing: 28/03/2014.