

CLINICOPATHOLOGICAL STUDY OF CERVICAL LYMPHADENOPATHYPradeep Kulal R¹, Sharvan R. Shanbhag², V. V. M. S. Kumar Dontamsetty³, Madhu B. S⁴, Ramu B. K⁵**HOW TO CITE THIS ARTICLE:**

Pradeep Kulal R, Sharvan R. Shanbhag, V. V. M. S. Kumar Dontamsetty, Madhu B. S, Ramu B. K. "Clinicopathological Study of Cervical Lymphadenopathy". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 54, July 06; Page: 9437-9448, DOI:10.14260/jemds/2015/1367

ABSTRACT: BACKGROUND AND OBJECTIVE: The analysis of lymph node enlargement in the neck is not an easy task. It is challenge for surgeon to assess its clinical behaviour and come to a final diagnosis. These diseases which can be neoplastic also demands correct diagnosis for further management. The study intends to find out systematically the various pathological conditions presenting with enlarged lymph nodes in the neck, also various modes of clinical presentation and behaviour of these conditions. Relevant investigations have also been studied. **METHODS AND MATERIALS:** The study population consisted of patients above 12 years presenting with cervical lymph node enlargement. The material consists of patients during the period of January 2011 to July 2012. This study consists of 100 consecutive cases. Diagnosis is made on the basis of histopathological findings. Patient was examined systemically giving utmost importance to local examination. After making a clinical diagnosis, further relevant investigations were done to confirm the diagnosis. Treatment was instituted appropriately and followed up the patients. **RESULTS:** Majority of the cases in this study had non-neoplastic causes for cervical lymphadenopathy in which tuberculosis is most common. Male and female ratio of 1.38:1 is noted with most cases between 12 and 30 years. Posterior triangle group of lymph nodes was most commonly affected in tuberculosis. In lymphomas level 2 group of among the groups of lesions, with regard to local characteristics like number, laterality, mobility and involvement of other group of lymph nodes etc .FNAC by virtue of it being inexpensive, quick in getting results and easy to perform, is one of the important and essential diagnostic procedures. **INTERPRETATION AND CONCLUSION:** Clinical symptoms in cervical lymphadenopathy is of limited significance because clinical behaviour can be highly variable As cervical lymphadenopathy is an important disease, it always calls for meticulous attention, analysis and treatment FNAC is found to be a frontline investigation of choice with biopsy and histopathological examination done for confirmation. Most of the non-neoplastic lesions are medically curable with limited role for surgery.

KEYWORDS: Cervical lymphadenopathy; FNAC; Histopathological examination.

INTRODUCTION: The prime function of lymph node is to deal with antigen, whether this be in the form of organisms or other particulate material, or even soluble antigen. Lymph nodes are strategically placed along the drainage of tissue and body fluids, they are most numerous in those areas which are different contact with the exterior of the individual.

Neck consists of 300 lymph nodes nearly 1/3rd of total lymph nodes of the body. The enlargement of the nodes is significant because of many etiological factors.

Lymphadenopathy is a very common clinical manifestations of many diseases. It is defined as an abnormality in the size or character of lymph nodes, caused by the invasion or propagation of either inflammatory cells or neoplastic cells into node. It results from vast array of diseases process whose brand categories are "MIAMI", this represents malignancies, infections, autoimmune disorders, miscellaneous and iatrogenic causes.

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Lymph Nodes may be the only site of disease. However most nodal diseases is related to abnormalities in the organ associated with the abnormal node.

The analysis of lymph node enlargement in the neck is not an easy task and the diagnosis of the condition is a problem because most of the diseases resemble each other.

The swelling in the cervical region can be diagnostic challenge. The study intends to find out systemically the various pathological condition conditions presenting with enlarged lymph nodes in neck, also the various modes of clinical presentation and behaviours of these conditions. It also intends to know the role of FNAC in diagnosing these conditions after correlating with a lymph node biopsy confirmation.

METHODOLOGY: MATERIALS: The clinical material consists of all inpatients and out patients of K.R hospital attached to MMC & RI. The material consists of patients during the period of January 2011 to July 2012. This study consists of 100 consecutive cases. Diagnosis is made on the basis of histopathological findings.

INCLUSION CRITERIA:

- Patients more than 12 years of age.
- Patients presenting with cervical lymphnode enlargement.

EXCLUSION CRITERIA:

- Patients less than 12 years of age.
- Patients where FNAC and/or biopsy of node could not be carried out were excluded.

METHODS: In this study the data was taken from K.R Hospital attached to MMC&RI. After patient arrival detailed history was taken, thorough examination was carried and basic relevant investigations was done in all patients to arrive at a provisional diagnosis.

Investigations like Fine Needle Aspiration Cytology and blood examination were done as a routine. Biopsy was done for all patients. Radiological examination of chest were done to find primary lesion of lung. Lymph node biopsy specimen was sent to pathologist for Expert opinion.

Also ENT opinion, contrast radiological investigations, X-ray endoscopy was carried out in relevant cases.

OBJECTIVES:

1. To study about various clinical presentations of cervical lymphadenopathy.
2. To correlate pathological findings with clinical diagnosis.
3. To study the role of FNAC by correlating with confirmed biopsy report.
4. To study the management, outcome and clinical behaviour of cervical lymph nodes on follow up.

RESULTS: In the present study 100 cases were selected in the surgery outpatient department and inpatient in surgical wards of K.R Hospital attached to MMC & RI, Mysore from period of January 2011 and 2012.

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	Number of Cases	Percentage
Non- neoplastic	80	80
Neoplastic	20	20
Total	100	100

Table 1: The number and percentage of non- neoplastic and neoplastic lesions

Histopathological Diagnosis	Number of Cases	Percentage
Tuberculosis	53	53
Reactive lymphadenopathy	27	27
Secondaries	14	14
Hodgkins lymphoma	1	1
Non-hodgkins lymphoma	5	5
Total	100	100

Table 2: Histo-pathological Diagnosis in 100 Cases

The maximum incidence was found to be of tuberculosis which were 53(53%) cases. Next was reactive lymphadenitis 27(27%) followed by secondaries (14%) and lymphomas (6%)

SEX	NUMBER OF CASES	PERCENTAGE
Male	58	58
Female	42	42
Total	100	100

Table 3: Sex Distribution

In the study, out of 100 cases studied 58 were males and 42 females. The male and female ratio is 1.38:1.

Age Group (years)	Male		Female		Total	
	No	%	No	%	No	%
12 to 20	6	6	8	8	14	14
21 to 30	19	19	13	13	32	32
31 to 40	14	14	8	8	22	22
40 to 50	7	7	6	6	13	13
51 to 60	7	7	3	3	10	10
>60	5	5	4	4	9	9
Total	58	58	42	42	100	100

Table 4: Age distribution in both sexes

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In this study, the observation made was the maximum number of cases were in the age group of 21-30 years (32 cases, 32%) Next common age group was between 31 and 40 years (22 cases, 22%). Thus the third and fourth decade constituted 54 of 100 cases (54%).

Fourteen cases (14%) were in the age group of 12-20 years and 13 cases were in the age group of 41-50 years and 10 between 51 and 60 years. Only 9 cases were documented above the age of 60 years.

Symptoms	Number of cases
Neck swelling	100
Pain	15
Fever	19
Cough	13
Loss of appetite	12
Loss of weight	17
Difficulty in swallowing	2
Change in voice	1

Table 5: Incidence of presenting symptoms

The constitutional symptoms considered were fever, pain, cough, sinus, loss of weight, loss of appetite and change in voice. The presence of any of the symptoms was considered positive for constitutional symptoms. All cases presented with swelling in neck. Fever was the most commonly present symptom, seen in 19% of cases, followed by loss of weight 17% of cases.

Contact with tuberculosis	Number of cases	Percentage
Positive	12	22.6
Negative	41	77.4

Table 6: History of contact with tuberculosis in tuberculosis lymphadenitis cases

Out of 53 cases of tubercular lymphadenopathy only 12 cases (22.6%) had a positive history of contact with tuberculosis.

Site	Tubercular cervical lymphadenitis	Reactive Lymphadenitis	Lymphomas	Secondaries	Total
Level I (submental and submandibular group)	9	10	0	0	19
Level II (upper jugular group)	14	6	3	7	30
Level III (middle jugular group)	7	1	0	4	12
Level IV (lower jugular group)	5	3	1	1	10

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Level V (posterior triangle group)	18	7	2	2	29
Level VI (anterior compartment group)	0	0	0	0	0
Total	53	27	6	14	100

Table 7: Site distribution of tubercular cervical lymphadenitis, reactive lymphadenitis, lymphomas, secondaries

As explained in literature, the neck lymph nodes were classified as levels and the involvement was studied for each category. In the present series, it was observed that posterior triangle group was the commonest to get involved in tuberculosis (33.9%) followed by upper deep jugular group (26.4%), submental and submandibular (16.9%), middle jugular (13.2%) and lower jugular (9.4%). Reactive lymphadenitis, submandibular and submental group of lymph nodes is most commonly affected. Secondaries, upper jugular group of lymph nodes is most commonly affected. Similarly in lymphomas upper jugular lymph nodes is most commonly affected.

Presentations	Number of cases	Percentage
Matted	20	37.74
Discrete	33	62.26
Total	53	100

Table 8: Discrete/Matted presentations of lymph nodes in tubercular cervical lymphadenitis

Out of 53 cases of tuberculosis cervical lymphadenopathy, in 20 cases the lymph nodes were matted (37.74%) and the rest were discrete (62.26%).

Chest x-ray	Number of cases	Percentage
Positive	5	9.43
Negative	48	90.57
Total	53	100

Table 9: Chest x-ray positivity in tubercular cervical lymphadenitis

Five cases of tubercular lymphadenopathy showed positive chest x-ray findings of pulmonology tuberculosis. Rest of 48 cases had no positive chest x-ray findings.

Lymph node group	Tubercular Cervical Lymphadenitis		Reactive Lymphadenitis		LYMPHOMAS	
	NO	%	NO	%	NO	%
CERVICAL+ INGUINAL	2	3.7	1	3.7	1	16.7
CERVICAL+ AXILLARY	2	3.7	4	14.8	0	0
CERVICAL+ AXILLARY+ INGUINAL	0	0	0	0	2	33.3

Table 10: Involvement of other lymph nodes in cervical lymphadenopathy

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In this study it was observed that 2(3.7%) cases had axillary lymph node involvement. So totally 4 cases (7.4%) of tubercular cervical lymphadenitis had lymph nodes elsewhere in the body.

Out of 27 cases of lymphadenitis, 4(14.8%) cases had axillary lymph node involvement, 1(3.7%) case had inguinal lymph node involvement. So totally 4 cases (7.4%) of tubercular cervical lymphadenitis had lymph nodes elsewhere in the body.

Out of 27 cases of reactive lymphadenitis, 4 (14.8%) cases had axillary lymph node involvement, 1(3.7%) case had inguinallymphnode involvement. So totally 5 cases (18.5%) cases had lymph nodes elsewhere in the body.

Totally lymphomas were 6 cases, 1 case (16.7%) had inguinal lymph node involvement enlargement in addition to cervical lymph node enlargement and 2 cases (33.3%) had generalised lymph node involvement.

Types of Lymphoms	Number of Cases	Percentage
Non hodgkins lymphoma	5	83.3
Hodgkins lymphoma	1	16.7
Total	6	100

Table 11: Main types of lymphomas

In this study, there were 6 cases of lymphomas which was confirmed histopathologically. Of the 6 cases, 5(83.3%) were non- hodgkins lymphoma and 1 (16.7%) was diagnosed to be Hodgkins lymphoma.

Primary site of malignancy	Histopathological pattern	Number of cases
Esophagus	SCC	4
Larynx	SCC	2
Stomach	Adenocarcinoma	2
Thyroid	Papillary carcinoma	2
unknown	SCC	3
	Adenocarcinoma	1

Table 12: Distributive of primary in malignant secondaries in neck

Totally there were 14 cases, who had malignant secondaries in neck .of these 14 cases, 4 were from esophagus, 2 each from larynx, stomach and thyroid. The remaining 4 cases had unknown primary.

FNAC	Number of cases
True positive	40
False positive	0
False negative	13
True negative	47
Total	100

Table 13: Sensitivity and specificity of FNAC in diagnosing tuberculosis cervical lymphadenitis

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$$\text{Sensitivity} = \frac{\text{True positive}}{\text{True positive} + \text{False negative}} \times 100$$

$$\text{Specificity} = \frac{\text{True negative}}{\text{True negative} + \text{False positive}} \times 100$$

Sensitivity = 75.5%
Specificity = 100%

FNAC	Number of cases
True positive	27
False positive	5
False negative	0
True negative	68
Total	100

Table 14: Sensitivity and specificity of FNAC in diagnosing reactive lymphadenitis

$$\text{Sensitivity} = \frac{\text{True positive}}{\text{True positive} + \text{False negative}} \times 100$$

$$\text{Specificity} = \frac{\text{True negative}}{\text{True negative} + \text{False positive}} \times 100$$

Sensitivity = 100%
Specificity = 93.1%

FNAC	Number of cases
True positive	13
False positive	0
False negative	1
True negative	86
Total	100

Table 15: Sensitivity and specificity of FNAC in diagnosing secondaries in cervical lymph nodes

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$\text{Sensitivity} = \frac{\text{True positive}}{\text{True positive} + \text{False negative}} \times 100$
$\text{Specificity} = \frac{\text{True negative}}{\text{True negative} + \text{False positive}} \times 100$
Sensitivity=92.8% Specificity= 100%

FNAC	Number of Cases
True positive	5
False positive	0
False negative	1
True negative	94
Total	100

Table 16: Sensitivity and specificity of FNAC in diagnosing lymphoma in cervical lymph nodes

$\text{Sensitivity} = \frac{\text{True positive}}{\text{True positive} + \text{False negative}} \times 100$
$\text{Specificity} = \frac{\text{True negative}}{\text{True negative} + \text{False positive}} \times 100$
Sensitivity=83.3% Specificity= 100%

Diagnosis	No of cases	Treatment	No. of cases	Outcome		
				Reco Vered	Not followed	Expired
Reactive lymphadenitis	27	Swelling antibiotics	27	27	0	0
Tubercular Cervical lymphadenitis	53	Swelling (ATT)	48	46	2	0
		Swelling With Cold abscess Or sinus ATT+I&D	5	5	0	0
Secondaries	14	Chemotherapy /radiotherapy	0	0	0	0
		Operated	2	2	0	0

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		Referred	12	0	11	1
Hodgkins lymphoma	1	Chemotherapy	1	1	0	0
		Referred	1	1	0	0
Non hodgkins lymphoma	5	Chemotherapy	4	4	0	0
		Referred	1	0	1	0

Table 17

DISCUSSION: The discussion is mainly based on analysis and observations made regarding presenting symptoms, clinical behaviour, signs, investigations, management and postoperative events in 100 cases of cervical lymph node enlargement attending to K.R Hospital attached to Mysore Medical College and Research Institute, Mysore during the period of January 2011 to July 2012. In the present study, which studies 100 cases of cervical lymphadenopathy, 80 were non-neoplastic lesions and 20 were neoplastic lesions.

In the study made by Shafullah and Syed Humayun Shah et al.¹ the incidence of non-neoplastic and neoplastic lesions were 90.6% and 9.4% respectively.

In the present study, tuberculosis accounted for 53% of cases, 27% turned out to be reactive lymphadenitis. Among the neoplastic lesions, malignant secondaries accounted for 14% while non – hodgkins lymphoma and Hodgkins lymphoma accounted for 5% and 1% respectively. The observation made by Jha BC et al.² who studied 94 cases, of which tuberculosis was confirmed in 63.8% cases.

	Tuberculosis	Reactive Lymphadenitis	Secondaries	Non-Hodgkins lymphoma	Hodgkins lymphoma
Shafullah et al	69%	17.8%	2.9%	3.4%	3.1%
Jha BC et al	63.8%	9.6%	20.7%		
Present study	53%	27%	14%	5%	1%

Table 18: Comparison of distribution of different lesions

Sex distribution in Cervical Lymphadenopathy: Of the 100 cases, 58 cases were males and 42 females. The sex ratio in the present study was 1.38:1(M: F)

	Bedi RS et al.	Ammari FF et al. ³	Dworski ⁴	Dandapat MC et al. ⁵	Purohit SD et al.	Present study
M:F ratio	1:1.7	1:2	1:1.38	1:1.2	1.4:1	1.22:1

Table 19: Comparative analysis of sex distribution

Most of these studies show female predilection. Few studies like Purohit SD et al and Tripathy SN et al are comparable with present study.

History of Constitutional Symptoms: In the present study, 15% of patients presented with pain, 19% with fever, 15% with cough, 12% with loss of appetite, 17% with loss of weight, 2 patients presented with dysphagia and 1 with change in voice.

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Site distribution in Cervical Lymphadenopathy: This study utilised the Memorial Kettering Hospital Classification of neck lymph nodes from level I to level VII.

It was observed that in tuberculosis, level V was most commonly affected (33.9%) followed by level II (26.4%). In secondaries Level II group was commonly involved (50%) and similarly in lymphomas level II group was involved.

In the Jha BC et al. series, level I group was most involved in tuberculosis. The result of this study is comparable to the study made by Baskota DK et al.⁶ study, wherein tuberculosis level V lymph nodes is most commonly involved.

In this present study, 20 cases (37.7%) showed multiple matted lymph nodes in tuberculous lymphadenopathy. Thirty- three cases (72.3%) showed single discrete lymph nodes. Jha BC et al. study showed matted lymph nodes in 38.3% of cases which is comparable with the present study.

Chest X-ray positivity was seen in 9.43% of cases of present study. The studies made by Aggarwal P et al. series showed 28.3% positivity and Jha BC et al. series showed 16% positivity.

In the present study, non- hodgkins lesion: hodgkins lesion ratio is 5:1. While findings by pehsc and shamie et al. had a ratio of 9:1. Raymond Alexandrian had a ratio of 5.02:1, which has similar results as this present study.

The commonest site of primary in a case of malignant secondary was lungs and pancreas in the studies by Linderman et al. In the present study by Osama gaberet al⁷, it was possible to establish primary in 86.7% whereas in the present study it was only 71.5%. In rest of cases, primary could not be diagnosed because of limited resources of our hospital.

Role of FNAC in Cervical Lymphadenopathy: In the present study, the sensitivity and specificity of FNAC in detecting various lesions of cervical lymph node are shown in the following table.

Histopathological Diagnosis	Sensitivity	Specificity
Tubercular lymphadenitis	75.8%	100%
Reactive lymphadenitis	100%	93.1%
Malignant secondaries	92.8%	100%
lymphomas	83.3%	100%

Table 20: The sensitivity and specificity of FNAC

The study by Jha BC et al. reported a sensitivity of 92.8% in diagnosing tubercular lymphadenitis. Dandapet MC et al. Reported a sensitivity of 83% for tuberculosis. The study by Chao SS, Loh KS et al. showed sensitivity of 88% and specificity of 96% for the same. Similarly Dasgupta A et al. reported a sensitivity of 84.4% for tuberculosis and 89% for malignant secondary deposits.

Prasad RR et al. studied 2216 cases and noted sensitivity and specificity of 84% and 95% respectively for tubercular lymphadenitis 97% and 99% for metastatic deposits, 80% and 98% for hodgkins disease .81% and 96% for non hodgkins lymphoma.

In the present study, FNAC sensitivity for tubercular lymphadenitis is low compared to above studies.

Treatment: In the treatment of tubercular lymphadenitis similar findings as in present study was obtained from Jha BC et al. where short course chemotherapy was given with no recurrence.

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Another study made by Kaulikama M et al. shows that all the patients recovered combination of anti-tuberculosis therapy and surgical treatment.

The reactive lymphadenitis were adequately managed with antibiotics and local treatment. The malignant secondaries and lymphomas were staged and treated as per accepted protocols and were referred to higher oncologic centers.

After coming to diagnosis treatment was instituted appropriately Forsecondaries and lymphoma, which needs radiotherapy, chemotherapy and expert oncologic surgeries, patient were referred to Kidwai Memorial institute of oncology, Bangalore.

For all patients, necessary advice given and were asked to attend the surgical outpatient department for follow up.

CONCLUSION: The clinical material consists of patient consecutively selected with history of cervical lymphadenopathy, who came to surgical OPD and who were admitted in wards of K.R Hospital attached to MMC & RI. One hundred consecutive cases were selected and they were personally studied in the present study.

Of the 100 cases, tuberculous lymphadenopathy had maximum incidence of 53% followed in reactive lymphadenitis (27%), secondaries (14%) and lymphomas (6%)

In investigations, Fine Needle Aspiration Cytology was found to be accurate with 75.5% accuracy for the diagnosis of tuberculosis. Few point were diagnosed as non -specific lymphadenopathy which were later confirmed by biopsy to have either tuberculosis or reactive lymphadenitis.

In metastatic lymph node, method of diagnosis was Fine Needle Aspiration Cytology and two patients were treated with surgery. One patient expired before referral. Rest 11 cases were referred to oncologic centre and they did not come for follow up

Lymphomas were diagnosed by Fine Needle Aspiration cytology and confirmed with excision biopsy.

Hodgkins lymphomas was treated with chemotherapy and was followed up regularly till the study concluded. No mortality noted.

Among 5 non hodgkins lymphoma cases, 4 cases were treated with chemotherapy and they were followed up regularly all the study concluded. No mortality noted during the study 1 case got referred to oncology center.

In the present study, fine needle aspiration cytology was found to be reliable and cheapest method of diagnosis without any significant morbidity and with good patient compliance.

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FINANCIAL OR OTHER

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Date of Submission: 06/06/2015.
Date of Peer Review: 08/06/2015.
Date of Acceptance: 29/06/2015.
Date of Publishing: 06/07/2015.