

**CERVICAL LYMPHADENOPATHY : CLINICO-PATHOLOGICAL STUDY OF 148 CASES**

**Saurabh Gakhar<sup>1\*</sup>, Tarun Ojha<sup>2</sup>, Kanak Yadav<sup>3</sup>, Abhishek Sharma<sup>4</sup>, Amit singhal<sup>5</sup>, Abhay Sharma<sup>6</sup>.**

*1, 3, 6. Resident , Dept. of ENT and HNS, Mahatma Gandhi Medical college and Hospital, Jaipur*

*4, 5. Assistant professor, Dept. of ENT and HNS, Mahatma Gandhi Medical college and Hospital, Jaipur*

*2. Professor and Head ,Dept. of ENT and HNS, Mahatma Gandhi Medical college and Hospital, Jaipur*

**\*Email id of corresponding author- [srbh\\_gkhr@rediffmail.com](mailto:srbh_gkhr@rediffmail.com)**

**Received: 05/12/2016**

**Revised: 28/02/2017**

**Accepted: 10/03/2017**

**ABSTRACT**

**Objective-** To study the incidence of disease in cervical lymph nodes by clinical examination and by studying pathology by fine needle aspiration cytology or excision biopsy. **Method:** This observational study was conducted at department of ENT Mahatma Gandhi medical college and hospital Sitapura Jaipur from June 14 to December 16 for a period of 2 and a half year .Where patients were studied for 2 years and follow up was done for 6 months. Total 148 patients were included in study. **Results:** Study group has 148 patients. Tuberculosis was the most common cause (44.6%) of cervical lymphadenopathy followed by reactive lymphadenopathy (28.38%); metastatic carcinoma and malignant lymphoma constitutes 18.9% and 8.1% respectively. The most common age group involved was 2<sup>nd</sup> and 3<sup>rd</sup> decade. Male patients were mostly affected in the study. The commonest size of nodal swelling was 2 – 4 cms. On examination maximum numbers of nodes affected in tuberculosis were level 5 followed by level 2. Reactive nodes were present mostly in level 2. Metastatic carcinoma submandibular and level 2 nodes were mostly involved. And lymphoma was found to be mostly involving level 2 nodes. FNAC was 90% effective in diagnosing tuberculosis patients and for the rest excision biopsy was done; while FNAC detected metastasis in all patients i.e. excision biopsy was not required. Excision biopsy done in all patients of lymphoma for purpose of immunohistochemistry. **Conclusion:** Tuberculosis is the most common cause of cervical lymphadenopathy followed by reactive lymphadenopathy and then by neoplastic lesions. FNAC is an effective modality for pathological diagnosis.

**Keywords:** Tuberculosis, Metastasis, cervical lymphadenopathy.

**INTRODUCTION:**

One of the commonest presenting complaints of patient in ENT OPD is Cervical Lymphadenopathy. <sup>1</sup> When apparent, lymph nodes are invariably reactive (hyperplastic), inflammatory or neoplastic. <sup>2</sup>

Assessment of cervical lymph nodes, the number, level in the neck and the presence of extra nodal spread are important prognostic indicators and determine therapeutic options. <sup>3</sup> These neck nodes drains scalp, face as well as from the nasopharynx, nose, sinuses, ear,

salivary gland, upper aerodigestive tract and thyroid. <sup>4</sup>

The workup of lymphadenopathy in the head and neck region requires close clinic pathologic correlation to arrive at an appropriate differential diagnosis, including patient age, prior medical history, clinical symptoms including anatomic location, and chronicity. The age of the patient is especially useful as the etiology of lymphadenopathy is vastly different in children compared with adults. <sup>5</sup>

Amongst the infective causes high prevalence of Tuberculosis is seen in the areas of Asia and Africa and is more common in areas with poor socioeconomic conditions.<sup>6, 7</sup> Tuberculosis is a multi-system disease with countless number of presentation and manifestations. Tuberculous Lymphadenitis (Scrofula) represents the most common form of extra pulmonary TB, and in 80% to 90% of cases, it is the only site of infection.<sup>8</sup>

If infectious diseases are taken into account then it is a most common cause of mortality worldwide.

Metastases in the upper and middle neck (levels I-II-III-V) are generally attributed to head and neck cancers, whereas the lower neck (level IV) involvement is often associated with primaries below the clavicles. The most frequent histological finding is Squamous Cell Carcinoma (90%), particularly when the upper neck is involved.<sup>5</sup>

The other finding Reactive lymphoid hyperplasia, it is commonly found in aspirates from enlarged cervical lymph nodes.<sup>5</sup>

Lymph nodes are classified into levels, on examination it is important to classify them into the level of node involved in disease. For reaching to a diagnosis certain tests are required like FNAC (Fine needle aspiration cytology), USG (Ultrasonography) Neck, and Excision biopsy.

FNAC is a well-accepted diagnostic test of choice for the assessment of cervical and supraclavicular lymphadenopathy in both adult and pediatric patients.<sup>5</sup>

In the majority of cases, FNAC can reliably distinguish between benign/reactive and malignant processes. Workup of metastatic neoplasms has shown both high sensitivity (91–98%) and high specificity (95–99%) with an overall accuracy rate of 94% to 97%<sup>5</sup>.

However, its role for the primary diagnosis of lymphomas has remained controversial<sup>9</sup>.

In the pediatric age group, FNAC is especially advantageous since tissue biopsy requires general anesthesia and the risk of potential morbidity, including scarring and cranial nerve injury<sup>10</sup>.

FNAC may reveal granulomas in tuberculosis, caseating granulomas are seen. In other disease Granulomatous lymphadenitis can be seen in sarcoidosis, foreign body reactions, and some infections such as mycobacterial and fungal infections.<sup>5</sup>

Excisional biopsy is required for definitive diagnosis if the FNAC is inconclusive, basically to exclude lymphoma or other infectious agents (atypical mycobacteria or fungi)<sup>3</sup>.

Ultrasound is commonly used for the evaluation of patients with enlarged cervical lymph nodes. Traditionally, staging of malignancy was performed by palpation which has a sensitivity and specificity of 60-70 percent.<sup>2</sup>

Ultrasound imaging has a sensitivity of 84 percent, a specificity of 68 percent and an accuracy of 76 percent in detecting abnormal nodes, improved further with the combination of ultrasound-guided fine-needle aspiration cytology (FNAC) to 97 percent sensitivity and 93 percent specificity.<sup>18</sup>

Ultrasound is a safe, widely available imaging technique that is patient-friendly and extensively used in most aspects of clinical medicine. In neck imaging, ultrasound use has become more prevalent with the development of real-time, high frequency ultrasound transducers, digital imaging technology coupled with the inherent anatomical advantage of the superficial structures of the head and neck. Ultrasound is currently the imaging modality of choice after clinical examination in ENT practice.<sup>2</sup>

Usually antibiotics are enough for acute infective lymphadenopathy.<sup>11</sup> Persistent lymph node enlargement can be a diagnostic dilemma. Diagnosis on clinical grounds or by routine laboratory investigations alone can be difficult.

A number of investigations may be required to reach a definite diagnosis in order to start treatment.<sup>12</sup>

## MATERIALS AND METHODS

This observational study was conducted at department of ENT Mahatma Gandhi medical college and hospital Sitapura Jaipur from June 14 to December 16 for a period of 2 and a half year. Where patients were studied for 2 years and follow up was done for 6 months.

148 patients of all age and both the sex with those not responding to conservative treatment and with enlarged cervical lymph node (size > 1cm) were included in the study. Exclusion criteria were patients with acute inflammatory nodal lesion, thyroidal and non-nodal lesions.

In all patients detailed history, ENT examination including oral cavity, nose, nasal endoscopy, Fiberoptic Laryngoscopy, ear examination was done. Depending on all these a clinical diagnosis was framed.

Then patients were subjected to following investigations i.e. CBC and ESR, Ultrasound Neck, X-ray chest PA view, FNAC Neck node and where necessary Excision biopsy.

Tissue was subjected for histopathological diagnosis was compared and all findings were analysed.

The data was analysed using SPSS 12 and studied in terms of ratio, percent, mean and frequency.

## RESULTS

In 2 years 534 patients with enlarged nodes were identified. USG Neck has been used in doubtful cases and as an aid for diagnosis. Those with suspicion of tuberculosis and malignancy were

investigated further. Rest were given antibiotics and were followed up, those who did not get relief were included in the study and for them FNAC of the enlarged node were done.

Total 148 patients were included in study. Excision biopsy was done in 52 patients.

Classification of various causes of cervical lymphadenopathy was done as per the cytomorphological pattern.

Table 1 depicts the frequency and percentage of various cause of cervical lymph node enlargement found in our study. Tuberculosis was the most common cause (44.6%) of cervical lymphadenopathy followed by reactive lymphadenopathy (28.38%); metastatic carcinoma and malignant lymphoma constitutes 18.9% and 8.1% respectively.

**Table 1. Causes of Cervical Lymph Node Enlargement**

Aetiology	Numbers of	Percentage
Tuberculosis	6	4
Reactive	4	2
Metastatic	2	1
Malignant	1	8
Total	1	1

The majority of cases (Table 2) with tubercular lymphadenitis were in second decade (36.4%) followed by third decade (31.8%). Reactive lymphadenopathy distributed equally in 2nd, 3rd & 4th decade (21.42%).

In metastatic carcinoma, & malignant lymphoma, majority of cases were in 5th decade, (39.3%), and 6th decade (50%).

**Table No.2 Age Distribution in Cervical Lymphadenopathy**

Age groups (In years)	Tuberculosis		Reactive lymphadenopathy		Metastatic carcinoma		Malignant lymphoma	
	No.	%	No.	%	No.	%	No.	%
Below 10	3	4.5	6	14.28	-	0	-	0%
11-20	24	36.4	9	21.42	0	0	3	25%
21-30	21	31.8	9	21.42	-	0	-	0%
31-40	9	13.63	9	21.42	3	10.7	3	25%
41-50	6	9.1	3	7.14	11	39.3	-	0%
51-50	3	4.5	3	7.14	8	28.6	6	50%
61-70	-	0	3	7.14	6	21.4	-	0%
	66	100%	42	100	28	100	12	100%

Male (Table 3) predominates in all groups. Sex ratio in tubercular lymphadenitis is 1.4: 1 and 1.8:1 in Reactive nonspecific adenitis. In cases of

metastatic carcinoma sex ratio is 4:1. Whereas in malignant lymphoma it is 5:1.

**Table 3 Sex Distribution in Cervical Lymphadenopathy**

Sex	Tuberculosis		Reactive lymphadenopathy		Metastatic carcinoma		Malignant lymphoma	
	No	%	No	%	No	%	No	%
Male	39	59.1	27	64.3	23	82.1	10	83.33
Female	27	40.9	15	35.71	5	17.8	2	16.67
Total	66	100	42	100	28	100	12	100

**Symptoms:**In tubercular adenitis, commonest symptoms was loss of appetite and loss of weight (50%), Fever (54.54%), Cough (45.5%) and pain (22.72%) were other symptoms. Two patients presented with tuberculous abscess. For patients in which FNAC was inconclusive, excision biopsy was done and the confirmed diagnosis of Tuberculosis was made.

In metastatic carcinoma most common symptoms were loss of appetite (70.00%) loss of weight (70.00%) and pain (50%).

Sore throat (57.14%) and cough (57.14%) were present as commonest symptoms in reactive lymphadenopathy while in malignant lymphoma, fever (75%); loss of weight (75) and loss of appetite were present in 75 % of the cases.

Most of the cases of Tuberculosis and metastatic carcinoma presented within 6 months from the onset of swelling i.e. 68.18% and 70% respectively. Whereas maximum number of cases of reactive lymphadenopathy had complaints of swelling since 3 to 6 months i.e. 35.71 %. Unilateral involvement was seen in all groups except malignant lymphoma in which bilateral involvement were present in 75% cases.

The commonest size of nodal swelling was 2 – 4 cms , in the tubercular adenitis nodes between 2-4 cms were 63.63%,with diagnosis of metastatic

**Table 4 Level of cervical lymphadenitis**

Level	Tubercular patients=66		Reactive lymphadenopathy patients=42		Metastatic carcinoma patients=28		Malignant lymphoma patients=12	
	No	%	No	%	No	%	No	%
1	3	4	12	28.57	22	78.6	5	41.7
2	31	46.9	26	61.9	24	80	7	58.3
3	12	18.2	-	0	12	40	5	41.7
4	8	12.1	-	0	3	10	-	0
5	42	63.6	6	14.28	18	60	3	25

For the metastatic carcinoma the most common site involved for metastasis was found to be Oropharyngeal carcinoma, in which maximum

**Table 5 Primary site in metastatic carcinoma**

Primary site	Number of patients	Percent
Larynx	5	17.8
Oropharynx	15	53.6
Hypopharynx	4	14.28
Nasopharynx	2	7.14
Unknown	2	7.14

In 60 patients FNAC was able to diagnose the disease while for the rest excision biopsy was

carcinoma 57.14% , reactive nodes 42.85% and for malignant lymphoma 75% patients had nodes of this size..

On examination maximum numbers of nodes affected in tuberculosis were level 5 followed by level 2. Reactive nodes were present mostly in level 2. Metastatic carcinoma submandibular and level 2 nodes were mostly involved. And lymphoma was found to be mostly involving level 2 nodes. There were multiple nodes involved in most of the diseases.

patients were suffering from tonsil carcinoma next is base of tongue malignancy. Next in frequency is Larynx.

required. It was effective in the diagnosis of tubercular lymphadenitis (90.9 per cent).The

FNAC report for other six patients was Non specific inflammation or Granulomatous lesion, excision biopsy was done for them. In metastatic carcinoma FNAC was able to diagnose the disease in all the patients. But for lymphoma Excision biopsy was required in all. Excision biopsy was done to get more tissue for immunohistochemistry.

On follow up the patients with Tuberculosis improved with Anti tubercular treatment, Malignancy patients were referred to Oncologist.

## DISCUSSION

Of approximately 800 lymph nodes in the body, about 300 are located in neck. Thus between one fifth and one sixth of all the nodes in the body are located in either side of neck.<sup>13</sup>

**Table 6. Comparison with other studies.**

	Gender Classification	Etiology	Age most affected
<b>Present study</b>	N=148 Male -99 Female -49	Tuberculosis-44.6% Reactive-28.38% Malignant-27.02%	2 <sup>nd</sup> & 3 <sup>rd</sup> decade
<b>Mogre D A<sup>14</sup></b>	N=250 108 males 142 females	Tuberculosis-56% Reactive-14.8% Malignant-6%	2 <sup>nd</sup> & 3 <sup>rd</sup> decade
<b>Abhishek Maheshwari<sup>15</sup></b>	N=100 Male -54 Female -46	Tuberculosis-45% Reactive-26% Malignant-21%	3 <sup>rd</sup> decade
<b>Mohammad asfaq<sup>16</sup></b>	N=100 Male -54 Female -46	Tuberculosis-58% Malignant-42%	3 <sup>rd</sup> decade
<b>Pir bux magsi<sup>17</sup></b>	N=140 Male -80	Tuberculosis-57.14% Reactive-21.43%	2 <sup>nd</sup> & 3 <sup>rd</sup> decade

Earlier the most commonly used classification of cervical nodes was given by Rouviere in 1938 who described collar, anterior and lateral cervical groups. In 1981 Shah et al suggested that anatomically based terminology be replaced with classification based on levels. The present numeric classification tells seven levels of cervical nodes.<sup>13</sup>

Our study included 148 patients having 99 males (66.9%) and 49 females (33.1%) with M: F ratio 2.02:1. Similar male preponderance was seen in other studies also.

In our study males were predominantly affected then females in cases of lymphoma where M: F is 5:1 similar findings were observed by Md. Atiqur Rahman et al<sup>1</sup>

	Female -60	Malignant-21.43%	
<b>Samir s amr</b> <sup>18</sup>	N=596 Male -376 Female -220	Tuberculosis-7.5% Reactive-23% Malignant-55.8% Infections&Others-13.7%	11-20 yrs
<b>Md atiqur Rahman</b> <sup>1</sup>	N=107 Male -58 Female -49	Tuberculosis-38.3% Reactive-31.8% Malignant-24.3% Infections&Others-5.9%	2 <sup>nd</sup> & 3 <sup>rd</sup> decade
<b>Mazhar Iqbal</b> <sup>19</sup>	N=220 Male -70 Female -150	Tuberculosis-70.4% Reactive-13.6% Malignant-15.84%	2 <sup>nd</sup> & 3 <sup>rd</sup> decade
<b>Maharjan M</b> <sup>20</sup>	N=155 Male and female equal numbers	Tuberculosis-54% Reactive-33% Malignant-11%	3 <sup>rd</sup> decade
<b>Hossain MZ</b> <sup>21</sup>	N=50 Male -34 Female -16	Tuberculosis-38% Reactive-22% Malignant-40%	Less than 40 yrs
<b>Gaurav Batni</b> <sup>22</sup>	N=64 Male -34 Female -30	Tuberculosis-28.12% Reactive-51.56% Malignant-20.48%	2 <sup>nd</sup> & 3 <sup>rd</sup> decade

In the present series maximum cases were found in 2<sup>nd</sup> and 3<sup>rd</sup> decade, similar findings were reported by Hossain MZ et al<sup>21</sup> while other study reported maximum cases between the age group of 21 to 30 years. Maximum incidence of tuberculosis was found in 2<sup>nd</sup> and 3<sup>rd</sup> decade of life whereas decrease number of cases were noted in older patients this could be due to better immunity in older patients, similar finding was

reported by Dr Mogre<sup>14</sup>, Abhishek Maheshwari et al<sup>15</sup> study.

Most of the cases of tuberculosis in our study were found with unilateral swelling i.e. 72.72% while bilateral cases were 27.27%, similar findings were found in study by Abhishek Maheshwari et al<sup>15</sup>, Baskota et al<sup>25</sup>, Vedi et al<sup>24</sup> where unilateral involvement was more

common than bilateral involvement. Majority of tubercular lymph node were firm in consistency i.e.59.09% this corresponds to the finding of Vedi et al<sup>24</sup> and Abhishek Maheswari et al<sup>15</sup> who found firm nodes to be 68.75% ,65% respectively.

Reactive lymphadenitis was second most common cause of cervical lymphadenopathy i.e.28%.

In our study we found that benign lesions were more common in younger age group whereas in older age malignant lesions were more common this is in agreement with most of the studies.

In our study non neoplastic lesions (Tubercular lymphadenopathy and reactive lymphadenopathy) was more common than the neoplastic lesions (metastatic carcinoma and malignant lymphoma) i.e. 72 % and 28% respectively. In non-neoplastic lesions tubercular lymphadenopathy (44.6%) was most common followed by reactive lymphadenopathy (28%) then metastatic carcinoma (20%) and lastly malignant lymphoma (8%). The tuberculosis being the disease with maximum patients with cervical nodes , similar findings were noted in most of the studies done in the asian region like in India,Pakistan,Bangladesh.

In study done by Gaurav batni maximum number of patients diagnosed to have reactive non specific nodes (51.1%). Study done at Jordan by Samir S. also found reactive lymphoid hyperplasia to be most common cause of node enlargement, next most common was malignant nodes in their study. In the United States, lymphomas rank third, after reactive hyperplasia and metastatic carcinoma, being diagnosed in 18% of cervical lymph nodes and in 15% of all peripheral lymph node biopsies in one large series from California<sup>23</sup>

In present study most of the swelling had size between 2-4 cms (62%) near similar finding also reported by Vedi et al<sup>24</sup> study, Abhishek maheswari et al<sup>15</sup>.

Metastatic lymph nodes were found to be third most common cause of cervical lymphadenitis in our study i.e. 20% of total cases and 8% cases were of malignant lymphoma. In the present study most common primary site of metastatic carcinoma was found to be oropharynx but in other studies by Hossain MZ et al<sup>21</sup> larynx was the primary site in 30.76% of cases.

## CONCLUSION

The study concluded the fact that tuberculosis is the most common cause of cervical lymphadenopathy followed by reactive lymphadenopathy and then by neoplastic lesions.

Initial Clinical examination is the key to decide further management. If conservative management fails or if there is high suspicion then neck nodes should be subjected to USG or FNAC. In lesions where FNAC is inconclusive excision biopsy can be done. Excision biopsy need not be done untimely as FNAC is a better tool especially if malignancy is suspected. Diagnosing of cervical lymphadenopathy is a team effort involving physician, surgeon and the pathologist.

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