



**PATTERN OF LYMPHADENOPATHY ON FNAC IN TERTIARY CARE HOSPITAL  
- A CROSS SECTIONAL STUDY**

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**ABSTRACT**

Lymphadenopathy is one of the commonest clinical presentation of various neoplastic and non neoplastic disorders at all age groups. Fine needle aspiration cytology (FNAC) is a simple, quick, inexpensive and minimally invasive technique that helps in diagnosing multiple lesions avoiding the need for biopsy. The aim of the documented study is to observe the various cytomorphological patterns of lymphadenopathy through FNAC, and to assess their age and sex specific distribution.

This study was conducted on 570 cases of lymphadenopathy over a period of 18 months from July 2016 to Dec. 2017 in the cytopathology section of department of pathology, Govt. Medical College, Amritsar. Cytological diagnosis was correlated with details of relevant clinical findings and investigations.

Out of total 570 cases studied, Tubercular lymphadenitis was found to be most common presentation of lymphadenopathy amounting to 249 cases (43.68%) followed by Reactive lymphadenitis (164 cases, 28.77%), Metastatic lymphadenitis (95 cases, 16.67%), Lymphoproliferative disorders (40 cases, 7.017%) and Suppurative lymphadenitis (22 cases, 3.85%) respectively. Highest incidence of lymphadenopathy was found in patients of 21-40 yrs age group (221 cases, 38.77%) followed by age group of 0-20 yrs (189 cases, 33.16%). Male to female ratio was 1:1.04 with slight male preponderance.

The present study concludes that Tubercular Lymphadenitis is arguably leading cause of lymphadenopathy at all ages with maximum incidence in children and adolescents. It also highlights the usefulness of FNAC in the early diagnosis of various causes of lymphadenopathy differentiating neoplastic from non-neoplastic causes, thus helping the clinician in arriving at an early diagnosis and timely management without any unnecessary surgical intervention.

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**INTRODUCTION**

Lymph nodes are most widely distributed and easily accessible component of lymphoid system.<sup>1</sup> They are among the commonest aspirated organ for diagnostic purpose. Lymphadenopathy is the term used to describe the conditions in which lymph nodes become abnormal in size, number and consistency. 75 % of all lymphadenopathies are localized, with 50 % being seen in head and neck area. 25 % of lymphadenopathies are generalized and are often a sign of significant systemic underlying disease.<sup>2</sup> Cervical lymphadenopathy is one of the commonest clinical presentation of patients attending the outdoor department.<sup>3</sup> Based upon the different geographical areas, the etiology of lymphadenopathy varies eg. in tropical areas, tuberculosis is a main cause of lymphadenopathy in adults and children.<sup>4</sup>

However, its prevalence is only less than 5% among Indian children aged between 0-14 years.<sup>5</sup> Nonetheless, in a large number of studies, the most common benign etiologies are non specific reactive changes in lymph nodes.<sup>6</sup> Despite the low prevalence of malignancy among patients with lymphadenopathy, it remains to be the main concern of both patients and physicians. Studies have shown that its prevalence is low among patients with unexplained lymphadenopathy.<sup>7</sup> FNAC is a reliable and least expensive method for developing countries.<sup>8,9</sup> It has become an acceptable and widely practiced minimally invasive technique as a first line investigation<sup>10</sup>

**MATERIALS AND METHODS**

A descriptive cross-sectional study was conducted over a period of 18 months ie. from July 2016 to Dec.2017 in the

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cytopathology section of Department of Pathology, Govt. Medical College, Amritsar. Brief history including age, sex, size and site along with thorough clinical examination was carried out. The FNAC was done on cohort of 570 patients with clinically significant lymphadenopathy using 20-24 G needle without local anaesthesia. Aspirated material was

Suppurative lymphadenitis was noted in 22 patients (3.85%) with majority (10 cases, 45.45%) of cases in 21-40 years age group. Tuberculous lymphadenitis accounted for a total of 249 cases (43.68%). This was the most common presentation of lymphadenopathy in the current study. Granulomatous inflammation with coexistent caseous necrosis was the dominant sub category in this group accounting for 231 cases

**Table 1** Distribution of various causes of Lymphadenopathy on FNAC

Age (years)	Sex	Reactive lymphadenitis	Suppurative lymphadenitis	Tuberculosis		Metastasis		Lymphoma			Alh
								HD	NHL	L	
0-20 (189)	M	59	2	31				2	2		1
	F	30	4	55			1	3	2		
21-40 (221)	M	21	2	52		9	3	3	1	3	
	F	34	8	77		3	1	7	-	1	
41-60 (118)	M	8	4	10		42	1	1	2		
	F	8	1	18		16		3			
61-80 (41)	M	2	1	3		15		1	1		
	F	2	-	3		9		-	1		
>80 (1)	M	-	-	-		1		-	-		
Total (570)		164(28.77%)	22(3.85%)	249(43.68%)	95(16.67%)		8	20	7	5	
								40(7.017%)			

HL: Hodgkin Disease, NHL: Non Hodgkin Lymphoma, L: Leukemia, ALH: Atypical Lymphoid Hyperplasia.

**Table 2** Comparison of studies showing incidence of Lymphadenopathy

Sr.no.	Studies	Tubercular lymphadenitis	Reactive lymphadenitis	Metastatic lymphadenitis	Suppurative lymphadenitis	Lymphoma
1	Present	43.68%	28.77%	16.67%	3.85%	7.02%
2	Nirmal	44.60%	35.47%	10.79%	9.35%	1.08%
3	Amit(2016)					
	Kochhar A K(2016)	38.52%	24.45%	30.37%	3.70%	2.22%
4	Chandran N(2014)	45.5%	27.2%	11.75%	9.5%	3.5%
5	Sharada Mani(2017)	45%	27%	9%	2%	-
6	Shrestha A K (2009)	42%	23%	10%	-	2%
7	Hira Chand(2009)	37.2%	41.5%	12.3%	3%	8.5%
8	Pardeep Tandon(2016)	32%	45.92%	10.34%	7.68%	2.97%
9	Chandra Lekha(2017)	37.5%	47.5%	13%	-	2%
10	Khajuria (2006)	52.3%	37.2%	3.8%	1%	2%

smear onto slides, air dried and fixed in methanol for May-Grunwald Giemsa (MGG) stain and wet alcohol fixed for Hematoxylin and Eosin. Ziehl Neelson ( ZN ) stain for acid fast bacilli was also used wherever required. Review of all the cytological reports was done to explore the patterns of lymphadenopathy. Various diagnosis were noted and categorized into groups including Tubercular, Reactive, Suppurative, Metastatic and Lymphoproliferative disorders.

**RESULTS**

In the documented study, 570 patients were subjected to FNAC for lymphadenopathy. There were 291 males and 279 females with M:F ratio of 1:1.04, i.e. with a slight male preponderance. The age at presentation ranged from 1 month to 87 years. Maximum number of patients were in the age group of 21-40 years (221 cases, 38.77 %) followed by age group 0-20 years (189 cases, 33.16%), 41-60 years (118 cases, 20.70%), 61-80 years (41 cases, 7.19%) and >80 years (1 case, 0.17%) respectively.

Reactive lymphadenitis was noted in 164 cases (28.77%). Among these patients, 89 patients (54.26%) were in 0-20 age group and 55 patients (33.54%) were in 21-40 year age group followed by 16 cases (9.76%) in 41-60 year age group and 4 cases (2.44%) in 61-80 years age group.

(92.77%) followed by 11 cases (4.41%) of granulomatous inflammation without caseation necrosis while suppurative granulomatous pathology was seen in only in 7 cases (2.81%). Tubercular lymphadenitis was seen maximum in the 21-40 year age group amounting to 129 cases (51.81%) followed by 0-20 age group i.e. 86 cases (34.54%). Of all the cases, 74 cases (29.7%) showed AFB positivity.

In the documented study, 23 cases (4.03%) were HIV positive and 1 case(0.17%) was HCV positive. Out of 23 cases of HIV, 12 cases (52.17%) showed reactive lymphoid hyperplasia, 7 cases (30.43%) showed tuberculous lymphadenitis, 2 cases of necrotizing lymphadenitis (8.69%) 1 case of NHL(4.35%) and 1 case(4.35%) of atypical lymphoid hyperplasia. Among the 23 cases of HIV positive patients, only 6 cases(26.08%) showed strong AFB positivity.

Metastatic carcinomatous deposits were observed in 95 cases (16.67%) predominantly above 40 years of age. Cervical lymph nodes were involved in all types of lymphadenopathies. Squamous cell carcinoma was the most common metastatic lesion in the documented study (61 cases, 64.21%) followed by adenocarcinoma (14 cases, 14.73%), and Non small cell undifferentiated carcinoma (11 cases, 11.58%). 4 cases (4.21%) showed metastatic deposits of small cell carcinoma, 3 cases (3.16%) showed metastatic deposits of Infiltrating

ductal carcinoma of breast and in 2 cases (2.1%) metastasis in cervical lymph node were seen from papillary carcinoma of thyroid. Metastatic lesions of lymph nodes were found to be more common in males (67 cases, 70.52%) as compared to females (28 cases, 29.47%).

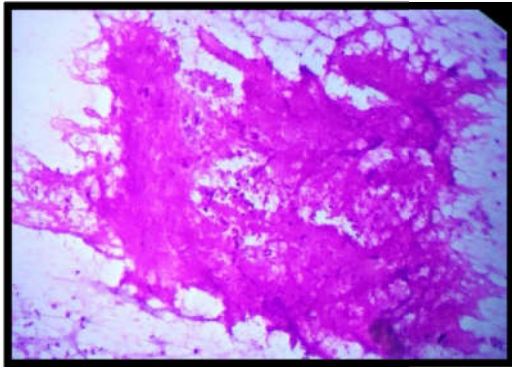


Figure1 FNAC Smear showing Caseation Necrosis

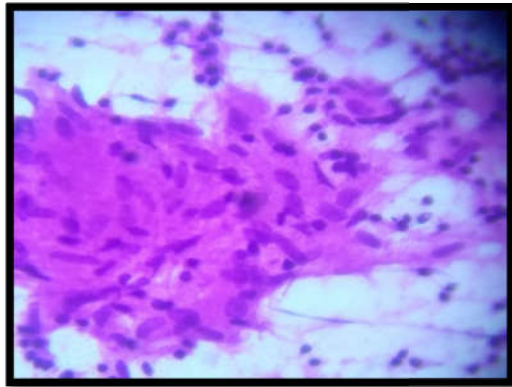


Figure 2 FNAC Smear showing Epithelioid Cell Granuloma

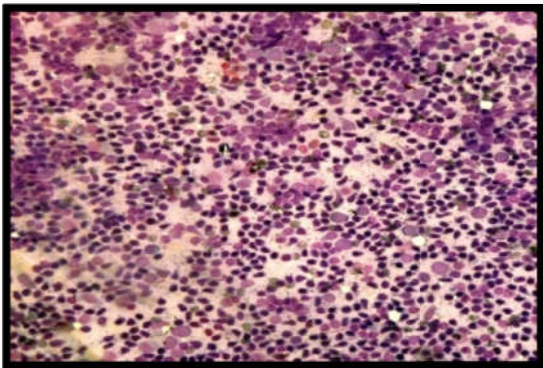


Figure 3 FNAC Smear showing Reactive Lymphadenitis

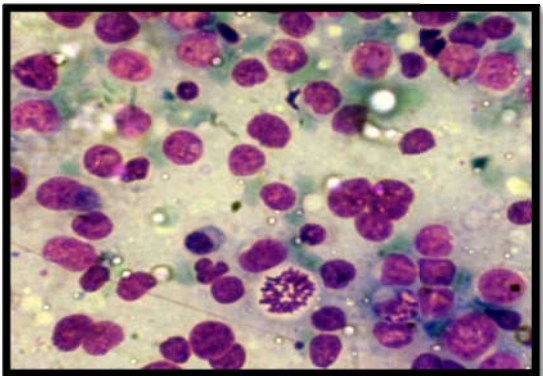


Figure 4 FNAC Smear showing Non Hodgkin Lymphoma

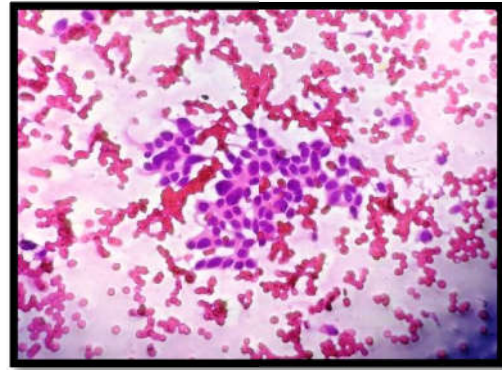


Figure 5 FNAC Smear showing Metastatic SCC

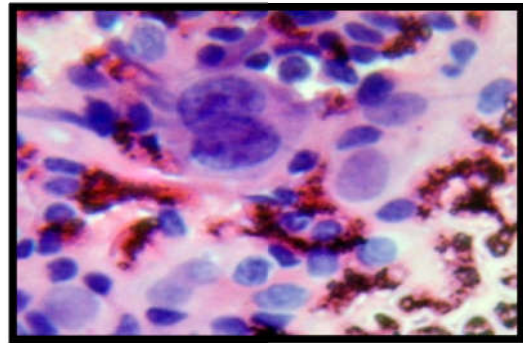


Figure 6 FNAC Smear of Hodgkin Lymphoma Showing RS Cell

Documented study observed only 40 cases (7.017%) of lymphoproliferative disorders. 20 cases (50%) were of Non Hodgkin Lymphoma (NHL) while Hodgkin's disease was seen only in 8 cases (20%). 7 patients (17.5%) presented with Leukemic infiltration of lymph nodes (3 cases of ALL and 4 cases of SLL/CLL) and 5 cases (12.5%) showed atypical lymphoid hyperplasia. Lymphoproliferative disorders were seen in 21-40 year age group (15 cases, 37.5%) followed by 41-60 year age group (11 cases, 27.5%), 0-20 age group (8 cases, 20%) and 61-80 years age group (6 cases, 15%). Lymphoproliferative disorders affected male patients (29 cases, 72.5%) more than the females (11 cases, 27.5%).

## DISCUSSION

Lymphadenopathy is defined as the enlargement of lymph nodes within contiguous anatomic regions. Viral, bacterial or mycobacterial infections are the most common causes of benign regional lymphadenopathy. Fine needle aspiration (FNAC) is inexpensive, completely safe and quick method for diagnosis of lymphadenopathy and it has reduced the need for surgical biopsy. In the documented study 570 cases of lymphadenopathy were subjected to FNAC. Our aim was to help the clinician in arriving at an early diagnosis in cases presenting with lymphadenopathy. Various patterns of lymphadenopathy were observed in our study namely Tuberculous lymphadenitis, Reactive lymphadenitis, Suppurative lymphadenitis, Metastatic lymphadenitis and Lymphoproliferative disorders including Hodgkin's disease, Non Hodgkin Lymphoma (NHL) and Atypical lymphoid hyperplasia. These patterns seen in our study were more or less same as reported in other studies in India and other developing countries.<sup>11,12</sup>

Most common cause of lymphadenopathy in the present study was found to be Tuberculosis (249 cases, 43.68%). In India, tuberculous lymphadenitis is one of the most common

type of lymphadenopathy encountered in clinical practice in contrast to very low frequency of 1.6% in developed countries.<sup>13</sup> The highest incidence of tuberculous lymphadenitis was seen in 3<sup>rd</sup> and 4<sup>th</sup> decade of life i.e. in 21-40 year age group (129 cases, 51.81%). Our findings were almost similar to the studies done by Nirmala Chandran<sup>11</sup>, Nirmal Amit<sup>14</sup> and Sharadamani<sup>15</sup> which showed incidence of tuberculosis as 45.5%, 44.6% and 45% respectively while at variance to those of Kochhar<sup>3</sup> (38.52%), Tandon<sup>16</sup> (32%) and Khajuria<sup>12</sup> (52.3%). Tariq Ahmed *et al*<sup>17</sup> in 2008 in his study observed tuberculous lymphadenitis as the most common pathology of the cervical lymph node lesions. Studies of all these authors including the documented study suggest that Tuberculous lymphadenitis is the most common cause of lymphadenopathy. This is attributed to the low socio-economic status, poverty, overcrowding, malnutrition, incomplete treatment, resistance and increased incidence of HIV infected patients.<sup>18</sup>

Recently, according to WHO report 2017, an estimated 10.4 million new cases of tuberculosis have been detected worldwide, 10% of which were infected with HIV. An estimated 1.7 million people died from tuberculosis. Global efforts to combat tuberculosis have saved an estimated 53 million lives since 2000 and reduced the mortality rate by 37%. Despite these achievements, tuberculosis remains the top infectious killer.<sup>19</sup>

The second most common cause of lymphadenopathy in the documented study was Reactive lymphadenitis (28.77%). This was found to be common in the younger age group of <40yrs (144 cases, 87.80%). Since infections from the oral cavity, ears, nose and paranasal sinuses drain into the cervical lymph nodes; reactive lymphoid hyperplasia is a common finding.<sup>20</sup> Similar findings were observed by Kochhar<sup>3</sup> (24.45%) and Shrestha<sup>4</sup> (23%) while Tandon<sup>16</sup> (45.5%) and Chandralekha<sup>21</sup> (47.5%) observed high incidence of Reactive lymphoid hyperplasia than tuberculosis.

Metastatic lymphadenopathy was seen predominantly above 40 yrs of age (83 cases, 87.37%) and was observed to be more common in males (67 cases, 70.52%). The superficial cervical lymph nodes are common sites of metastasis. FNAC has a documented higher sensitivity in diagnostic workup of metastatic malignancies which may be due to the fact that the metastatic carcinoma cells are usually abundant and their cytological features are dissimilar to that of the cells of normal or hyperplastic lymph nodes<sup>22</sup>. Present study documented 16.67% cases with metastatic lymphadenopathy. Similar findings were observed by Chandralekha<sup>21</sup> (13%) and Hirachand<sup>23</sup> (12.3%). Ruchi Khajuria<sup>12</sup> observed only 3.8% cases of metastatic lymphadenopathy and this variation in results is due to difference in age groups of patients, as most of the metastatic lesions are common above 40 yrs of age. Metastatic Squamous cell carcinoma (SCC) was found to be in majority of cases (61, 64.21%) followed by Adenocarcinoma (14 cases, 14.73%). Similar high incidence of metastatic SCC was observed by Nirmal Amit<sup>14</sup> (76.67%), Hirachand<sup>23</sup> and Shilpa *et al*.<sup>24</sup>

The anatomical site of involved lymph node along with age, sex and cytomorphological patterns often give clue to the site of primary tumor. For example, upper cervical lymph nodes commonly harbours the metastatic deposits from aerodigestive tract and midcervical harbours metastasis from thyroid.<sup>3</sup> Intranuclear cytoplasmic inclusions suggest metastasis from

papillary carcinoma of thyroid as observed in the documented study (2 cases, 2.1%). FNAC is a useful prognostic tool in stage 3 cancers wherein metastasis to regional lymph nodes is usually found. It also aids in the diagnostic workup of a metastatic tumor of unknown origin<sup>14</sup> as observed in the documented study (11 cases, 11.58%).

## CONCLUSION

Tuberculosis stands out to be the most common cause of cervical lymphadenopathy in India and the top infectious killer. Present study also concludes Tuberculosis as the most common cause of Lymphadenopathy followed by Reactive lymphadenitis, metastatic lymphadenitis (particularly squamous cell carcinoma), lymphoproliferative disorders and Suppurative Lymphadenitis. Documented study highlights the usefulness of FNAC in diagnosing the various patterns of lymphadenopathy thus helping the clinician in arriving at an early diagnosis and timely management of curable causes of lymphadenopathy like infections and tuberculosis. FNAC combined with clinical correlation can be used as a first line investigation in work up of lymph node lesions. It helps in early diagnosis and saving the patients from high mortality and morbidity.

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