

A 2-Year Retrospective Study on Fine-needle Aspiration Cytological Changes of Lymph Node Enlargement among Cases Reported in Outpatient Department of Government General and Chest Hospital Hyderabad

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Abstract

Introduction: In countries like India, Tuberculous lymphadenitis is a very common cause of superficial lymphadenopathy. Fine-needle aspiration cytology (FNAC) is a well-established and popular diagnostic aid for patients presenting with lymphadenopathies. Frequent involvement of lymph nodes in regional and systemic diseases along with their easy accessibility makes FNAC the first line of investigation in evaluating lymphadenopathies. Lymph node enlargement occurs in a wide spectrum of diseases including reactive conditions, infections such as tuberculosis, fungal, and protozoal as well as primary lymphoid malignancies and secondary metastatic tumors. Tuberculosis is most common etiology in our India. FNAC is a highly acceptable, minimally invasive, cost effective, and rapid investigation of choice that is feasible in our current scenario.

Aims and Objectives: To evaluate cytopathological changes of FNAC changes of enlarged lymph node. To assess the frequency of lymphadenopathy in different age groups and genders.

Materials and Methods: Facility-based study was done during August 2017 to July 2019 at Government general and chest hospital among patients 459 patients who attended outpatient department of chest hospital, with lymph node enlargement and underwent FNAC evaluation in the department of pulmonology.

Results: Gender-wise distribution of patients, males 218 (47.4%) and females 241 (52.6%). Cytological diagnosis of lymph node aspirations, tubercular lymphadenitis 165 (35.9%), Reactive lymphadenitis 152 (33.1%), Acute suppurative lymphadenitis 50 (10.8%), Granulomatous lymphadenitis 35 (7.6%), metastatic deposits 48 (10.4%), non-Hodgkin lymphoma 8 (1.7%), and Hodgkin lymphoma 1 (0.2%). Distribution of cases of lymphadenopathies according to anatomical location were cervical (67.5 %), submandibular (10.6%), supraclavicular (9.8 %), axillary (7.82%), and submental inguinal (1.8%).

Conclusion: The present study highlighted the various cytomorphological patterns of lymphadenopathy and revealed a huge burden of tuberculous lymphadenitis.

Key words: Fine-needle aspiration cytology, Lymph node enlargement, Lymphadenitis

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INTRODUCTION

Lymphadenopathy refers to enlarged lymph nodes. It is the most common clinical presentation of patients attending the outpatient department. Fine-needle aspiration cytology (FNAC) is the first line of investigation in evaluating lymphadenopathy due to frequent involvement of

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lymph nodes in regional and systemic diseases and easy accessibility. The technique is minimally invasive and gives speedy result.^[1] It is highly acceptable, simple, rapid, cost-effective procedure that is feasible in the current scenario.^[2] It can be used as safe alternative to excision biopsy.^[3] Lymph node enlargement occurs in a wide spectrum of diseases including reactive conditions, infections, and malignancy.^[4] Tuberculosis is a widely distributed in all over world more particularly in a country like India since an ancient time. Peripheral lymph node involvement is the commonest form of extra-pulmonary mycobacterial disease and cervical region is the most frequent site. Nowadays, due to increase in prevalence of HIV there is increased incidence of tuberculous lymphadenitis. Even with the best treatment available, tuberculosis of lymph node still remains a problem for the clinician, because of late diagnosis, poverty, and ignorance of symptoms. Patients' compliance is poor with surgical excision biopsy followed by histopathological examination which is costly, time consuming, required hospitalization, pre- and post-procedure complications. While FNAC is simple, rapid, cheaper, and outpatient department procedure.

Aims and Objectives

1. To evaluate cytopathological changes of FNAC changes of enlarged lymph node
2. To assess the frequency of lymphadenopathy in different age groups and genders.

MATERIALS AND METHODS

Facility-based cross-sectional study was done from August 2017 to July 2019 at Government General and Chest Hospital among 459 patients who attended the outpatient department of chest hospital, with lymph node enlargement and underwent FNAC evaluation in the department of pulmonology. A 22–24-gauge needle and 10 ml syringe was used to perform FNAC. Two of the prepared smears were fixed in alcohol and stained with hematoxylin and eosin stain.

Sample size of 459 was achieved using the formula $4 pq/1^2$, considering the prevalence of tubercular lymphadenitis of 44.02% according to Malhotra *et al.*^[5]

RESULTS

Out of 459 cases, 57 were neoplastic and 402 were found to be inflammatory. Tuberculosis was the most common disease found in 165 (35.9%) patients followed by reactive nonspecific lymphadenitis in 152 (33.1%), acute suppurative lesions in 50 (10.8%), granulomatous lymphadenitis in 35 (7.6%) cases, metastatic tumors in 48 (10.4%), and lymphomas in 9 patients

and most commonly involved are cervical group of lymph nodes as shown in Table 1 and Figure 2.

Based on anatomical location, majority of lymphadenopathy was seen among cervical group of lymph node constituting to 67% followed by submandibular constituting 11%, supraclavicular lymph nodes 10%, axillary 8%, and submental and inguinal constituting 2% each as shown in Figure 1.

DISCUSSION

Lymphadenopathy is a frequently encountered clinical presentation requiring prompt and accurate diagnosis to provide treatment at the earliest possible. In the present

Table 1: Descriptive analysis

Variable	Total (n)	Percentage
Gender		
Male	218	47.4
Female	241	52.6
Age in years		
0–20	151	32.8
21–40	181	39.4
41–60	75	16.3
61–80	52	11.3
Cytomorphological changes		
Tubercular lymphadenitis	165	35.9
Reactive lymphadenitis	152	33.1
Acute suppurative lymphadenitis	50	10.8
Metastatic deposits	48	10.4
Granulomatous lymphadenitis	35	7.6
Non-Hodgkin lymphoma	8	1.7
Hodgkin lymphoma	1	0.2

Association between tubercular and non-tubercular changes of the Lymph node enlargement based on gender

Gender	Tubercular	Non tubercular
Male	53	165
female	112	129
Total	165	294

P-value=0.00000038, Odd ratio=0.37, Male population were found to be less effected with tubercular lymphadenitis compared to female population

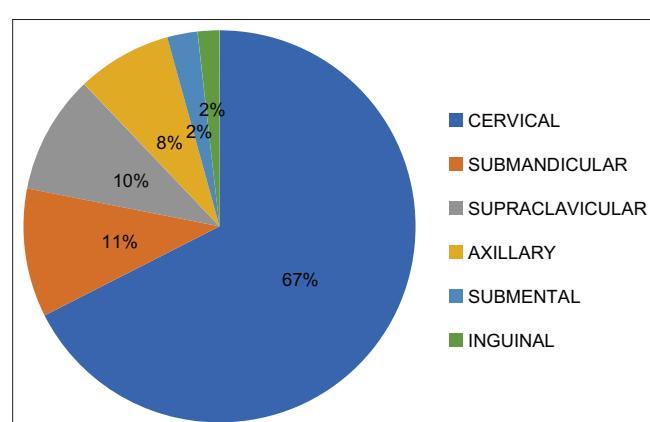


Figure 1: Distribution of cases of lymphadenopathies according to anatomical location

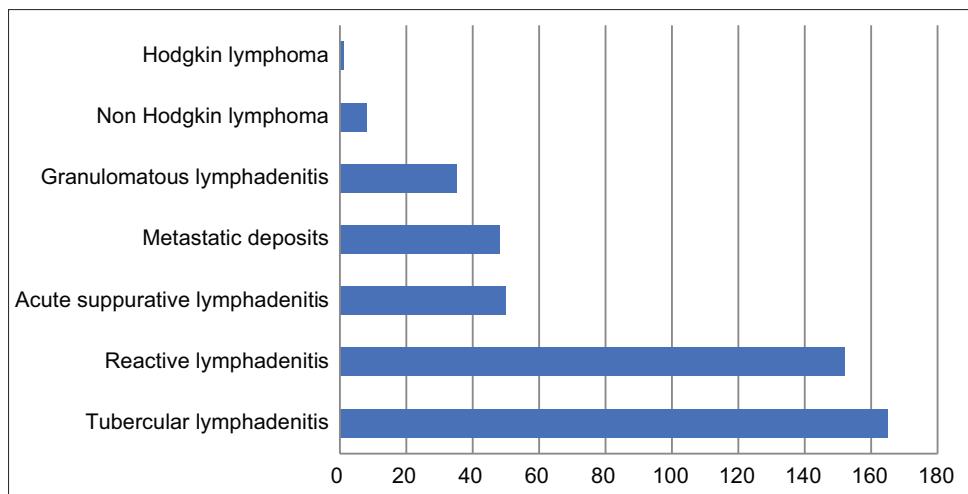


Figure 2: Bar diagram showing the distribution of cytopathological changes of lymph nodes

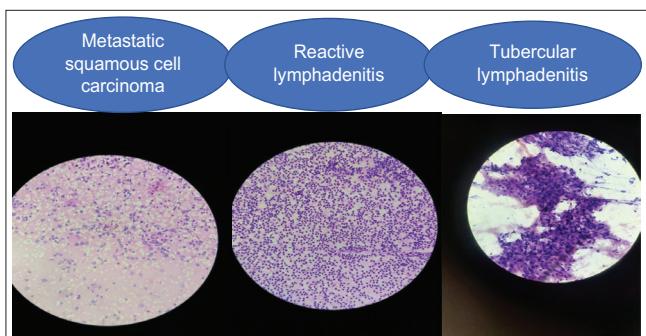


Figure 3: Histopathological changes of various lymph node changes

study, a total number of cases were 459 over a period of 2 years. The pattern of these cases varied from non-neoplastic lesions such as tuberculous lymphadenitis, reactive lymphadenitis, acute suppurative lymphadenitis, granulomatous lymphadenitis to neoplastic lesions including metastatic lymphadenopathy, and lymphoma. FNAC is the first line of investigation in the diagnosis of lymph node lesions. It is safe, inexpensive, and highly acceptable to the patient.

In our study, an attempt has been made to study the cytomorphological spectrum and also epidemiological pattern of lymph node lesions. Cervical group of lymph nodes was the most common group involved seen in 67.5% of cases which is similar to that observed by Sharma *et al.*^[6] Pavithra *et al.*,^[2] and Kochhar *et al.*^[7] It was followed by submandibular group of lymph nodes in 10.6% cases and least commonly involved are inguinal lymph nodes seen in only 1.8% cases.

Most of the patients in this study were in the age group of 21–40 years similar to Pandit *et al.*,^[8] whereas in the study of Sharma *et al.*,^[6] most of them were of 10–19 years and in Gupta *et al.*'s study,^[9] it is 0–20 years. In the present study,

females were predominant than males with M: F of 1:1.1 as shown in Table 1 and in Sharma *et al.*^[6] study, it is 0.87:1.

Tuberculous lymphadenitis was the most common lesion reported in 35.9% of cases similar to the study of Sharma *et al.*,^[6] in which it is about 56.92%. Most of these cases were seen in the age group of 21–40 years with female predominance as shown in Table 1. ZN staining for acid-fast bacilli were seen in 55% cases, while Sharma *et al.*^[6] reported 22.6% cases.

In cases with characteristic caseous necrotic material and scattered epithelioid with or without granulomas or only necrotic material with neutrophilic infiltration were diagnosed as tuberculous lymphadenitis even though AFB were absent in the smears histopathological changes as shown the Figure 3c.^[10] The second most frequent diagnosis in our study was reactive as shown in Figure 2 and histopathological changes of reactive lymphadenitis as shown in the Figure 3 similar to the study of Sharma *et al.*^[6] and Khan *et al.*^[11] Acute suppurative lymphadenitis was observed in 10.8% cases in the present study comparable to other studies of Kochhar *et al.*,^[7] Sharma *et al.*,^[6] and Patra *et al.*^[12]

Granulomatous lymphadenitis was reported in only 7.6% of cases in our study. Granulomas can also be seen in a variety of other conditions of lymphadenopathy such as leprosy, fungal infections, sarcoidosis, cat scratch disease, lymphogranuloma venereum, and collagen vascular diseases^[13] Lymph node aspirations in 10.8% of cases showed metastatic deposits with male preponderance and adenocarcinoma being the most common histologic type. Maximum cases of metastatic deposits were seen in the age group of 61–80 years and cervical group of lymph nodes were predominantly involved. A detailed history, clinical examination, radiological investigations, and immunohistochemistry in selected cases may help to locate the primary site of malignancy.

The present study also comprised nine cases, i.e., 1.9% which were diagnosed as lymphoma comparable to observations of Sharma *et al.*^[6] Fathima *et al.*^[14] (5.2%), and Hirachand *et al.*^[15] (6.1%).

Among these cases, non-Hodgkin's lymphoma and Hodgkins lymphoma constituted 1.7% and 0.2%, respectively. This is also comparable to study by Bhaskaran *et al.*^[16] in which NHL and HL constituted 2.23% and 0.74%. These cases were later confirmed by biopsy.

CONCLUSION

FNAC is an excellent first line of investigation to determine the nature of lesion. It is quick, safe, minimally invasive, reliable, and readily acceptable by patient. The present study highlighted the various cytomorphological patterns of lymphadenopathy and revealed a huge burden of tuberculous lymphadenitis.

LIMITATIONS

1. FNAC is only suggestive of the pathological changes as biopsy is confirmatory.

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