

ORIGINAL RESEARCH

Study of cytological diagnosis in lymph node aspirations done in a tertiary care hospital

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ABSTRACT

Background: The lymph nodes are an integral component of the immune system and their enlargement is a common presentation in the clinical practice. FNAC of lymph nodes are a very useful and simple tool in the diagnosis of lymph node malignancies. It may be the only tool in the diagnosis of metastatic lesions in the lymph nodes and can help to detect occult primary malignancies. The objective of this study is to describe the cytomorphologic features of various lymph node pathologies on fine-needle aspiration cytology (FNAC), to tabulate the cytological findings into neoplastic and non-neoplastic pathology and to determine the most common morphological pattern of lymph node pathology. **Methodology:** Ambi-directional descriptive study was done over a period of 1 year and 70 samples who fit into the inclusion criteria were included. The cytopathological reports of the 70 FNAC study cases were collected, categorized and compiled. **Results:** The mean age of the study participants was 37.43±21.26 years. Majority (45.7%) of the participants were found to be in the age group of 19-45 years. Of the total sample studied, prevalence of malignant disorder was found to be 13(18.5%). All the malignant lesion were in people above 45 years of age except for 2 cases of squamous cell carcinoma observed in a 32 and 38 year old male. It was observed that the benign lesion is more common in the younger age group and the risk of malignancy increases with increase in age. **Conclusion:** FNAC being the most common investigation done, is important for both appropriate risk stratification and for guiding the clinical management. Differentiation of neoplastic and non-neoplastic cases significantly reduces unnecessary surgical biopsy for diagnosis of lymphadenopathies.

Key words: FNAC, lymphadenopathy, lymphoma

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INTRODUCTION

Lymph nodes are the vital immunological organs. They are easily overlooked and rather featureless structures at the gross level but they are very complex structures at the microscopic level^[1]. Lymph nodes, a crucial part of the host defence system, filters or traps the foreign particles and act as a site for antibody production. Lymph nodes should routinely be examined grossly and microscopically since they may reflect lesions in organs and tissues they drain. Moreover, special attention should be given to lymph nodes that are more likely to be exposed to a test compound. The term lymphadenopathy refers to lymph nodes which are abnormal in size, number or consistency, the causes of which range from an infectious process to a malignant disease. It is difficult to determine the cause of lymphadenopathy on the

basis of history and physical examination alone. Although there are many different conditions which present with lymph node enlargement, the most common cause for enlargement of regional lymph nodes include secondary to tuberculosis lymphadenitis, malignancies, reactive hyperplasia, Hodgkin lymphoma, non-Hodgkin lymphoma, pyogenic abscesses and other chronic inflammatory conditions. Enlarged lymph nodes are easily accessible for fine needle aspiration and hence fine needle aspiration cytology (FNAC) is a very simple and important diagnostic tool for lymph node lesions. FNAC of lymph nodes is a very useful and simple tool in the diagnosis of lymph node malignancies. It may be the only tool in the diagnosis of metastatic lesions in the lymph nodes and can help to detect occult primary malignancies. For the diagnosis of

lymphomas, it can suggest a preliminary diagnosis, which can be followed by histopathology and immunohistochemistry for confirmation. Hence, the cytopathologist plays a vital role in the diagnosis of lymph node malignancies. Due to its minimally invasive nature, FNAC has several advantages over standard tissue biopsy^[2-5]. FNAC of lymph nodes is a safe, easy, cheap, quick diagnostic tool and reduces the need for diagnostic excisional biopsy in many patients^[6].

AIMS AND OBJECTIVES

The aim of this study was to study the cytological diagnosis of the lymph node aspirations. The objective of this study is to describe the cytomorphologic features of various lymph node pathologies on fine-needle aspiration cytology (FNAC), to tabulate the cytological findings into neoplastic and non-neoplastic pathology and to determine the most common morphological pattern of lymph node pathology.

METHODOLOGY

A descriptive ambi-directional observational study was done among the patients presenting with lymphadenopathy to a tertiary care hospital in Trichy. The data was collected from the period of Jan 2022 to Jan 2023. The data regarding the clinical features of all the patients who underwent Fine Needle Aspiration Cytology of lymphnodes reported to department of pathology, along with radiological findings, form was collected during this interval. The cytopathology reports of lymphnodes FNAC during the study period were included and those FNAC from swelling other than lymph nodes were excluded from the study. Thus, a total of 70 FNAC specimens were included in our study. The cytopathological reports of the study cases were collected, categorized and compiled. The study was started after obtaining approval from

the institutional ethical committee. The data collected was entered in MS excel and analysis was done using SPSS software version 23. The frequency distribution of the benign and malignant lesion was analysed along with the age and gender association.

RESULTS

The mean age of the study participants was found to be 37.43±21.26 years and the age ranged from 8 years to 85 years. Majority (45.7%) of the participants were found to be in the age group of 19-45 years followed by 32.9% more than 45 years and 21.4% of them are <18 years of age. Of the total male participants 26.67% were less than 18 years old, 33.33% were aged 19-45 years and 40% were more than 45 years old. While the majority (55%) of the female participants were 19-45 years old, followed by 27.5% aged more than 45 years and 17.5% are under 18 years of age.

Of the total sample studied, prevalence of malignant disorder was found to be 13(18.5%). All the malignant lesion was found in people above 45 years of age except for 2 cases of squamous cell carcinoma observed in a 32 and 38-year-old male. There was a statistically significant difference (p value 0.004) observed in distribution of the benign and malignant lesions according to the age category. It was observed that the benign lesion is more common in the younger age group and the incidence of malignant lesion increases with increase in age. It was also observed that the malignant lesion were more common in male compared to female in our study and was statistically significant. The 6(8.6%) cases of squamous cell carcinoma 5(83.33%) were found in male and only 1(16.67%) female. One case of metastatic papillary thyroid carcinomatous deposit was found in a 62 years old female patient. Among the benign lesion the most common diagnosis observed was reactive lymphadenitis found in 28(40%), followed by granulomatous lymphadenitis and granulomatous tuberculous lymphadenitis in 10(14.4%) and 7(10%).

Table 1: Distribution of site of lymph nodes examined

Site of lymph node	Frequency N (%)
Cervical node	40(57.1)
Axillary node	9(12.09)
Inguinal node	8(11.4)
Submandibular node	7(10)
Submental node	3(4.3)
Upper jugular node	1(1.4)
Supraclavicular node	1(1.4)
Posterior auricular node	1(1.4)

Table 2: Frequency distribution of cytological diagnosis of lymph nodes examined

Cytological diagnosis	Frequency N (%)
Acute suppurative lymphadenitis	2(2.9)
Reactive lymphadenitis	35(50)
Granulomatous lymphadenitis	17(24.3)
Lymphoproliferative disorder	3(4.3)
Malignant disorder	13(18.6)

Table 3: Association between gender and the cytological diagnosis

Diagnosis	Male N(%)	Female N(%)	p value
Acute suppurative lymphadenitis	1(50)	1(50)	0.018
Reactive lymphadenitis	15(42.85)	20(57.15)	
Granulomatous lymphadenitis	3(17.65)	14(82.35)	
Lymphoproliferative disorder	3(100)	0	
Malignant disorder	8(61.53)	5(38.47)	

p value <0.05 is considered to be significant.

Table 4: Distribution of cytological diagnosis among different lymph nodes

Location of lymph node	Cytological diagnosis				
	ASL	RL	GL	LPD	MD
Cervical node	1	17	12	1	9
Axillary node	1	6	0	1	1
Inguinal node	0	6	1	1	0
Submandibular node	0	2	3	0	2
Submental node	0	2	1	0	0
Upper jugular node	0	0	0	0	1
Supraclavicular node	0	1	0	0	0
Posterior auricular node	0	1	0	0	0

ASL-Acute suppurative lymphadenitis, RL-Reactive lymphadenitis, GL-Granulomatous lymphadenitis, LPD-Lymphoproliferative disorder, MD-Malignant disorder.

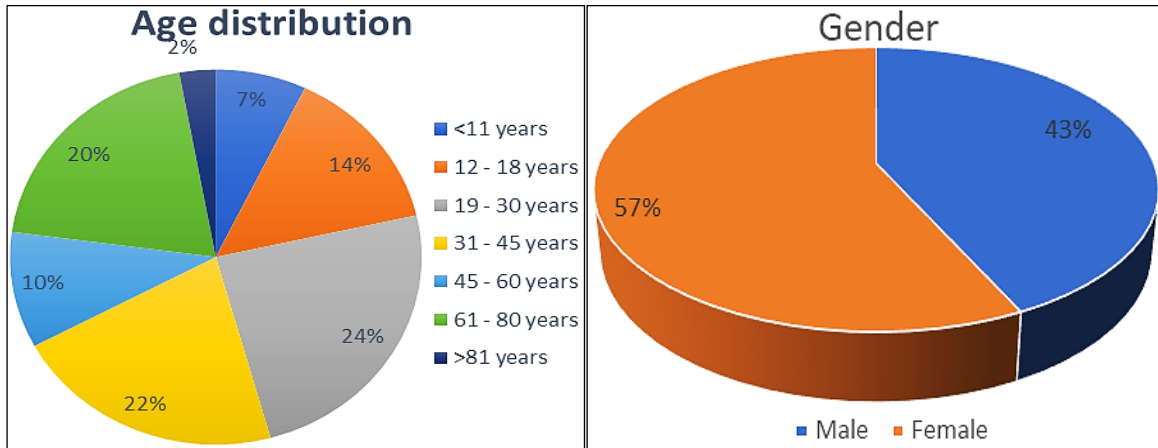


Figure 1: Age distribution among the study participants

Figure 2: Distribution of sex among the study participants

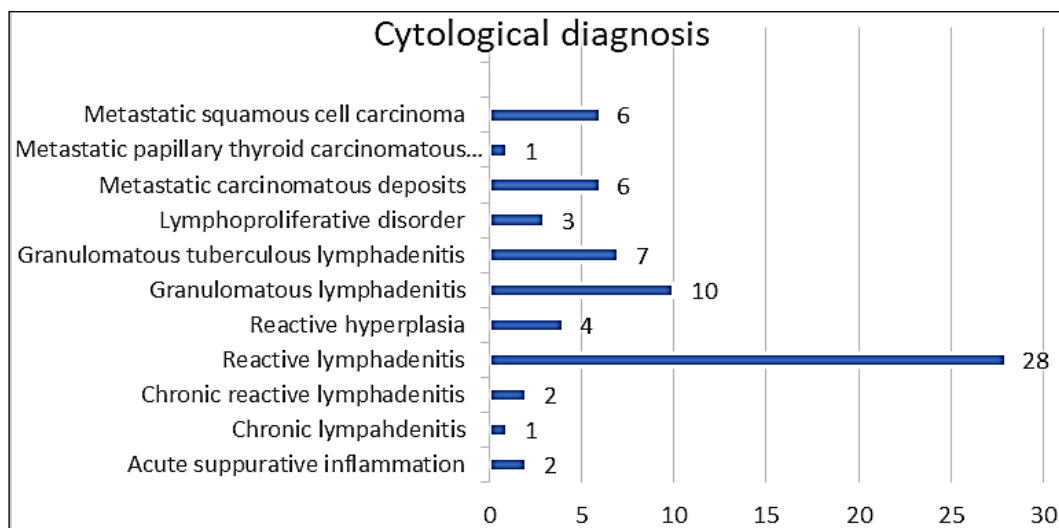


Figure 3: Cytological diagnosis of the Lymph node specimen

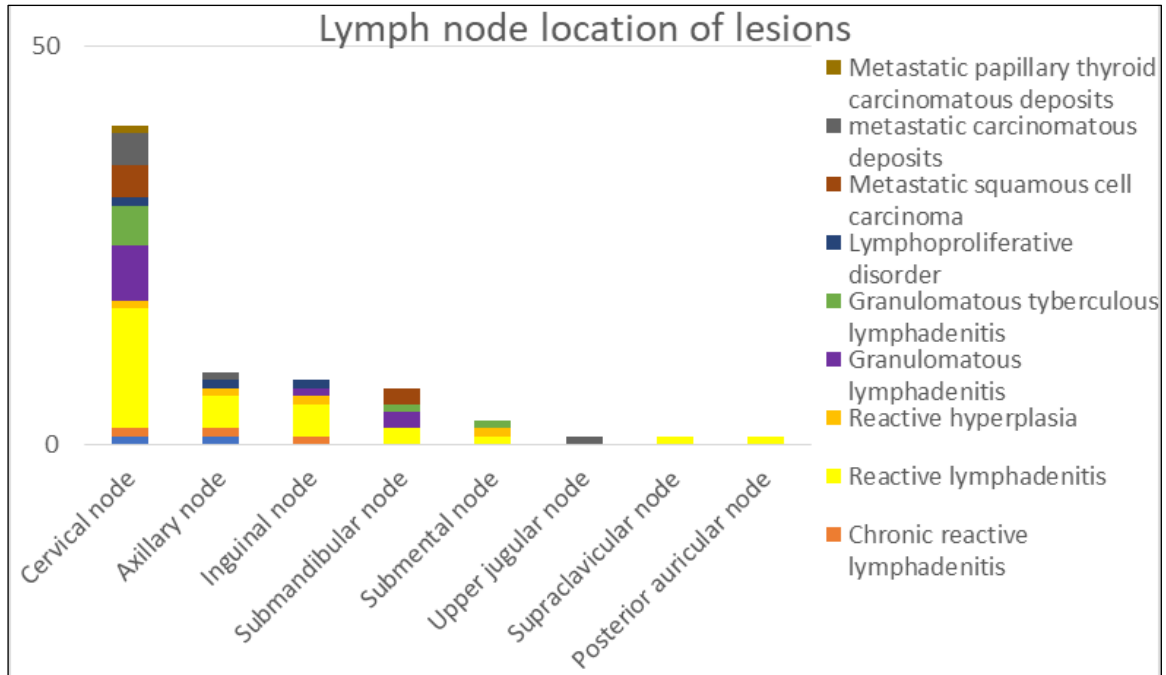


Figure 4: Lymph node location for various diagnosis

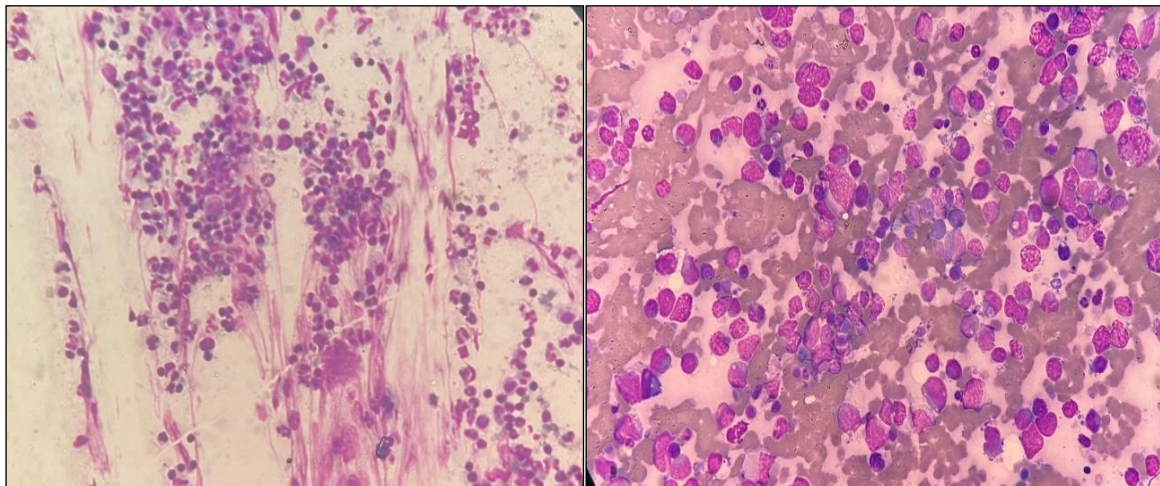


Image 1: Acute suppurative inflammation

Image 2: Lymphoma

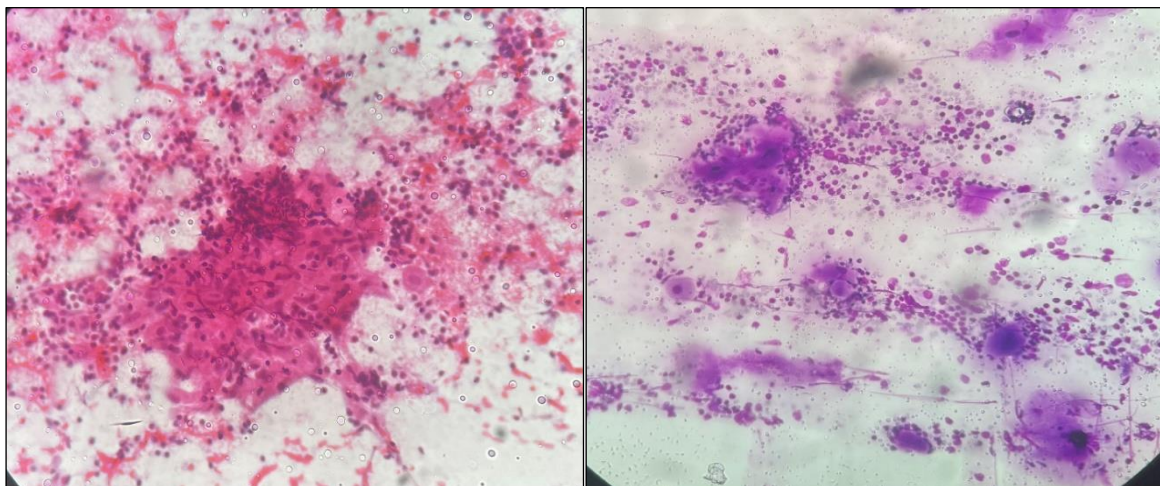


Image 3: Granulomatous tuberculous lymphadenitis

Image 4: Metastatic squamous cell carcinoma

DISCUSSION

In a study done by Gupta AK, Nayar M, Chandra M on reliability and limitations of fine needle aspiration, 1,261 cases with clinically significant lymphadenopathies were studied. The first phase, consisting of 100 cases, the cytologic diagnosis was compared with histopathology, to standardizing the procedure. In the second phase, consisting of 1,161 patients FNAC was the primary modality of diagnosis and highest diagnostic accuracy was observed in metastatic carcinoma. Tuberculous lymphadenitis, reactive hyperplasia and lymphoma were also diagnosed with almost similar accuracy. Although FNAC has proven to be a simple, safe, reliable and cost-effective diagnostic tool for lymphadenopathies, the limitations of the procedure, like the difficulty to diagnose certain diseases like reactive hyperplasia and non-Hodgkin's lymphoma should be kept in mind and excision biopsy used whenever required^[7]. In a study done by Behm FG, O'Dowd GJ, Frable WJ, the histology of 28 lymph nodes with benign hyperplasia were assessed for evidence of the effects of fine-needle aspiration prior to biopsy. Only 43% of the lymph nodes showed evidence of prior aspiration. This consisted of needle tracts occupying less than 5% of any one section in ten cases, and 10% in two cases. In none of the 28 lymph nodes did prior fine-needle aspiration interfere with the histologic evaluation. The authors conclude that fine-needle aspiration does not interfere with subsequent histologic evaluation of lymph-adenopathy^[8]. Ton Eryilmaz O, Ucak R, Ozagari AA, *et al.*, in their study of diagnostic value of lymphnode fine-needle aspiration of 392 lymphnodes showed that 61% had Reactive lymphoid hyperplasia, 15.6% has metastasis, granulomatous lymphadenitis in 6.1%; pyogenic abscess in 2.6%; 1% of necrosis; 0.5% of non-Hodgkin lymphoma and non-diagnostic being 7.1%. The overall diagnostic sensitivity, specificity, PPV, and NPV of FNAC of lymph nodes were 87.9%, 100%, 100% and 89.7%, respectively. The overall diagnostic accuracy was 94.1%. In case of malignancies, the histopathological correlation was 100%. Of four cases with false negative, three were low-grade non-Hodgkin lymphoma and one was granulocytic sarcoma^[6]. In our study the mean age of the study participants were found to be 37.43±21.26 years, ranging from 8 years to 85 years. This was almost similar to the findings of Shruti Vimal *et al.*^[9]. Who showed a mean value of 41.5 years with a range of 1 to 82 years. Also in a study done by Zhou J^[2]*et al.*, a similar result of 38 ± 9 years of mean and 8 to 73 years range was observed. They also showed that the 30-39(30%) and 40-49(25.4%) years age group were the highest affected with lymph node disease and >60 years were the least affected. Almost a similar finding was observed in our study having 45.7% of the lymph node disease in 19-45 years age group and Shruti Vimal *et al.*^[9], showing 20-30 years with slight male preponderance, while there was female preponderance

in both our study and in the one done by Zhou J. In our study the prevalence of malignant disorder was found to be 13(18.5%). All the malignant lesion was found in people above 45 years of age except for 2 cases of squamous cell carcinoma observed in a 32 and 38-year-old male. But almost 53% of the lymph nodes were diagnosed with malignant disease in the study done by Zhou J *et al.*^[2]. These differences may be due to the variation in geographical location and life style factors. He also showed 15.2% of chronic non-specific lymphadenitis, 7.5% of reactive lymph node, pyogenic abscess (2.9%); tuberculosis lymphadenitis(8.7%); Hodgkin lymphoma(4.8%) and non-Hodgkin lymphoma(7.16%). Shruti Vimal *et al.*^[9]. Showed 33.69% of reactive hyperplasia 28.88% of tubercular lymphadenitis and 33 cases of metastatic malignancy. In our study the most common lymph node involved was cervical 57.1% followed by axillary involving 12.09% and inguinal node of 11.4%. Of the 40 cervical lymph node biopsies, the common diagnosis was found to be 17 cases of reactive lymphadenitis followed by 12 granulomatous lymphadenitis and 9 cases of malignancies. And a similar preponderance of these diseases was observed both in axillary and inguinal nodes. The most common lymph node involved in case of reactive and granulomatous lymphadenitis and the malignant disorders were the cervical lymph node. With all these evidences it can be told on a bold term that FNAC can be considered to be an inexpensive and reliable tool for early diagnosis of the disease.

CONCLUSION

Lymphadenopathy is associated with a wide range of disorders; though majority of these were benign, metastatic malignant deposits of lymph nodes were one of the common causes of enlarged lymph nodes in the current study. FNAC being the most common investigation done, it is important for both appropriate risk stratification and for guiding clinical management. Differentiation of neoplastic and non-neoplastic cases significantly reduces unnecessary surgical biopsy for diagnosis of lymphadenopathies. It is also observed in many studies that the FNAC doesn't affect the histological evaluation of lymph nodes.

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