Section: Pathology

Original Research Article

STUDY OF PATTERN OF LYMPHADENOPATHY ON FINE NEEDLE ASPIRATION CYTOLOGY IN A TERTIARY CARE HOSPITAL AT RAJKOT, GUJARAT, INDIA

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ABSTRACT

Background: "Lymph node" refers to a small, bean-shaped structure that is part of the lymphatic system, which plays a crucial role in the body's immune defense. FNAC (Fine Needle Aspiration Cytology) is a minimally invasive diagnostic procedure used to obtain cell samples from a mass, swelling, or lymph node using a thin, hollow needle for microscopic examination. Aim: To study the non-neoplastic and neoplastic lesions of enlarged lymph nodes by FNAC in patients with lymphadenopathy in the Cytopathology laboratory, Pathology Department, P.D.U. Medical College & Hospital, Rajkot.

Material and Methods: In our study, all clinically diagnosed cases of lymphadenopathy that presented to the Cytopathology Section for Fine Needle Aspiration Cytology (FNAC) over a period of five months, from January 2025 to May 2025, were included.

Results: During a period of 5 months, a total 201 cases were reported. Out of 201 cases, 164 (81.59%) were non neoplastic whereas 37 (18.40%) were neoplastic cases. In the present study, lesions were observed across all age groups, ranging from 3 months to 80 years. The peak incidence of non-neoplastic lesions was noted in the age group of 21 to 40 years, whereas the peak incidence of neoplastic lesions was observed in individuals above 50 years of age. Out of 201 cases, 105 cases (52.23%) were males and 96(47.76%) cases were females.

Conclusion: Understanding the pattern of lymphadenopathy is crucial for making a confident and conclusive diagnosis or for raising a strong clinical suspicion of an underlying disease.

Keywords: Lymph nodes, FNAC, Lymphadenopathy.

INTRODUCTION

A lymph node is an oval-shaped organ of the lymphatic system, distributed widely throughout the body and linked by lymphatic vessels and consist of B, T and other immune cells. Lymph nodes are widely distributed collections of lymphoid tissue that form an essential part of the lymphoreticular system. Due to their easy accessibility, they are most frequently examined lymphoid tissue Only clinically or radiologically enlarged lymph nodes are selected for Fine Needle Aspiration. In adults lymph nodes greater than 1 to 2 cm are an immediate source of concern and unless the cause is evident enlarged lymph node should be aspirated. Lymphadenopathy in all age groups is common and it can be due to reactive hyperplasia; so it is often observed and not aspirated unless the node is large or persistent. Fine Needle Aspiration (FNA) is a simple, rapid, and minimally invasive diagnostic technique. Its importance also lies in providing early guidance for further necessary investigations and management of the lesion.

Objective

To study cytopathological distribution of various lesions in lymph nodes and their relation to different age groups, gender and site of lymph node involved.
To study the non-neoplastic and neoplastic lesions of enlarged lymph nodes using Fine Needle Aspiration Cytology (FNAC) in patients presenting with

lymphadenopathy at the Cytopathology Laboratory, Department of Pathology, P.D.U. Medical College, Rajkot.

To compare our study findings with other relevant similar studies.

MATERIALS AND METHODS

All clinically diagnosed cases of lymphadenopathy that presented to the Cytopathology Section for Fine Needle Aspiration Cytology (FNAC) over a period of five months, from January 2025 to May 2025, were included in this study.

Most of the patients were referred from TB-chest, Surgery, ENT, Pediatric and Medicine department mostly. Clinical details and brief history of the patient were retrieved from the cytology request forms and coordination with concerned clinician.

In all these patients FNAC had been conducted with the help of 22-gauge disposable needle using 10cc syringe.

The aspirated material had been smeared onto minimum 4 slides atleast. Two Smears had been immediately fixed in 95% ethyl alcohol and stained with Hematoxylin and Eosin and Papanicolaou stain. The remaining air-dried smears were routinely stained using the May-Grünwald Giemsa (MGG) stain.

Special stain like Ziehl Neelsen (ZN) stain for acid fast bacilli had been done for suspected cases.

All prepared smears are reported in cytopathology laboratory.

RESULTS

Patient Demographics

A total of 201 patients with lymph node FNAC were included in the study. In our study, age of the patient ranged from 1-80 years. (TABLE-1) Maximum number of cases 78(38.80%) were seen in the age group 21-40 years followed by 54(26.86%) in 1-20 years respectively.

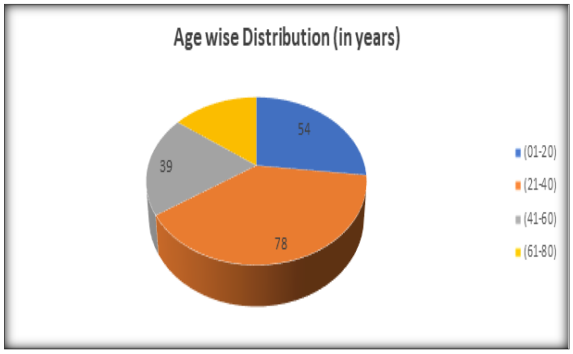

Chart 1: Age wise Distribution

In our study consisting of 201 cases 105(52.23%) were males and 96(47.76%)were females. (TABLE-2)

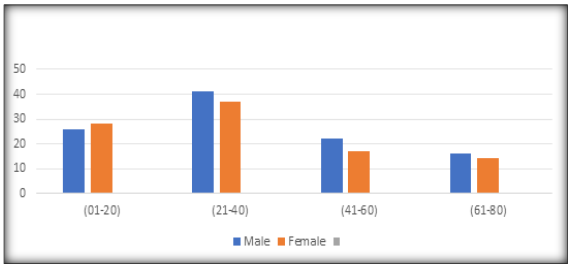

Chart 2: Age and Sex wise incidence of lymph node lesion

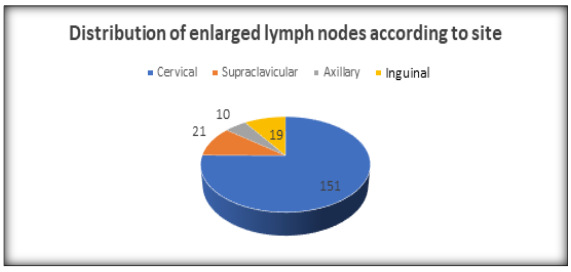

Chart 3: Distribution of enlarged lymph nodes according to site

In our study the maximum number of patients presented with cervical lymphnode enlargement 151(75.12%) followed by Supraclavicular 21(10.44%), Inguinal 19(9.45%), Axillary 10(4.97%). (TABLE- 4).

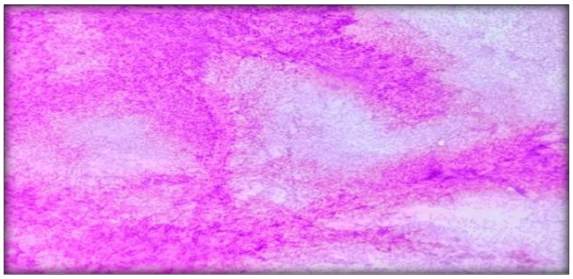

Figure 1: Reactive Lymphadenitis

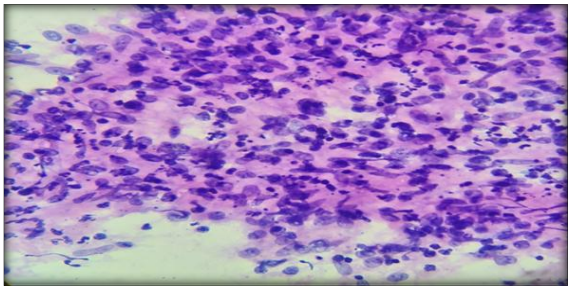

Figure 2: Koch's Lymphadenitis; epitheloid granuloma

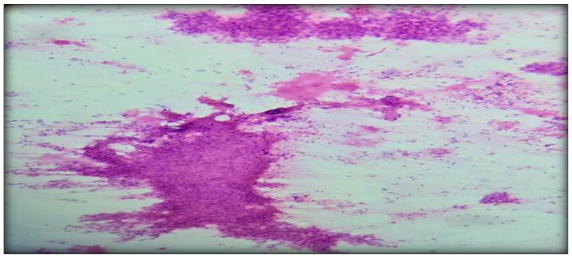

Figure 3: Metastatic lymph node; Squamous cell carcinoma

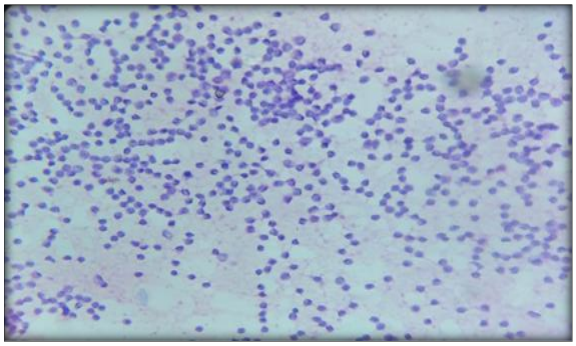

Figure 4: Lympho proliferative lesion; Monomorphic population

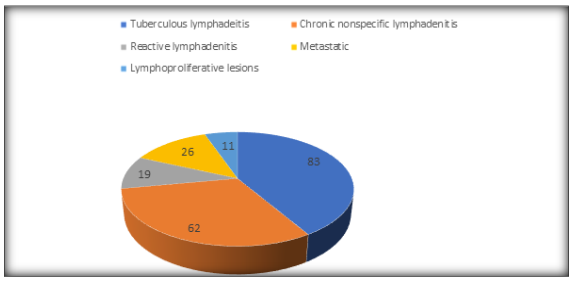

Chart 4: Incidence of various pathological conditions of lymph nodes.

Out of 201 cases of lymph node aspiration majority were tuberculous lymphadenitis 83(41.29%) followed by chronic nonspecific lymphadenitis 62(30.84%), Reactive lymphadenitis 19(9.45%), Metastatic malignancy 26(12.93%), Lymphoproliferative lesions 11(5.47%).

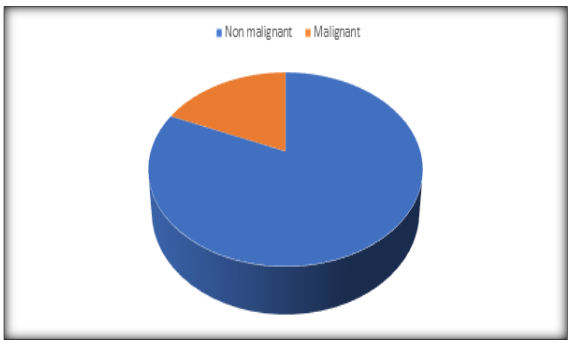

Chart 5: Incidence of benign and malignant lesions of lymph node

In present study 164(81.60%)cases have Non-malignant lesions and 37(18.40%) cases have malignant lesions findings.

In total 83 cases of tuberculous lymphadenitis Ziehl Neelsen stain was done. Out of that 70(84.33%)cases were positive for acid fast bacilli and 13(15.66%) were negative. [Table 7]

Table 1: Distribution of FNAC study of Lymph node according to Age group

Age range(20 years)	No. of Cases	Percentage
01-20	54	26.86%
21-40	78	38.81%
41-60	39	19.41%
61-80	30	14.92%
Total	**201**	**100%**

Table 2: Distribution of FNAC study of Lymphnode according to gender

Gender	No. Of Cases	Percentage
Male	105	52.23%
Female	96	47.77%
Total	201	100%

Table 3: Distribution of FNAC study of Lymph nodes according to Age and Sex

Age range(20 years)	Male	Female	Total	Percentage
01-20	26	28	54	26.87%
21-40	41	37	78	38.80%
41-60	22	17	39	19.40%
61-80	16	14	30	14.93%
Total	105	96	201	100%

Table 4: Distribution of enlarged lymph nodes according to site

Lymphadenopathy site	No. Of Cases	Percentage
Cervical	151	75.12%
Supraclavicular	21	10.45%
Axillary	10	4.98%
Inguinal	19	9.45%
Total	201	100%

Table 5: Incidence of various pathological conditions of lymph nodes

Cytological diagnosis	No. Of Cases	Percentage
Tuberculous lymphadenitis	83	41.29%
Chronic nonspecific lymphadenitis	62	30.84%
Reactive lymphadenitis	19	9.46%
Metastatic Malignancy	26	12.94%
Lymphoproliferative lesions	11	5.47%
Total	201	100%

Table 6: Incidence of benign and malignant lesions of lymph node

Lesion	No. of Cases	Percentage
Non-Malignant	164	81.60%
Malignant	37	18.40%
Total	201	100%

Table 7: Result of Ziehl Neelsen stain in Tuberculous lymphadenitis

Ziehl Neelsen stain	No. of Cases	Percentage
AFB positive smear	70	84.33%
AFB negative smear	13	15.67%
Total	83	100%

DISCUSSION

The lesions arising in the lymph node can be found in patients ranging from early to advanced age. In our study youngest patient was 3 years old and Oldest patient was 80 years old. Majority of lesions found in 21-30 years of age group.

Most common lesion on cytology was found to be tuberculous lymphadenitis peak age incidence was seen during 2nd and 3rd decade similar findings were seen in study done by Khajuria R et al(Jammu,2006), Sharma P et al(haryana, 2015) reported an incidence of 52.3% and 56.9% in their studies somewhat higher than our study (41.29%). Out of 83 cases of tuberculous lymphadenitis 70 cases (84.33%) were AFB positive. The second most common lesion was chronic nonspecific lymphadenitis (30.84%)Followed by reactive (9.45%), Metastatic malignancy (12.93%), Lymphoproliferative lesions (5.47%).

The 3rd most common lesion was Metastatic carcinoma (12.93%). Majority of metastatic carcinoma to lymph node was squamous cell carcinoma. Majority of metastatic malignancy was found in above 50 years old age group.

Males showed preponderance of higher patients in tuberculosis may be because of malnutrition and overall low living standards among males in this area. The cervical lymph node was the most common node to be involved by all types of lymphadenopathy. Followed by Supraclavicular, Axillary and inguinal lymph node. In our study ratio of Non-neoplastic to Neoplastic lesions was 4.0:1.

Table 8: Showing comparison of FNAC of non neoplastic and neoplastic lymphadenopathies with various other studies

Serial no.	Study	Non neoplastic	Neoplastic	Ratio
1	Hirachand et al(Kathmandu,2006)	81.7%	18.3%	4.42:1
2	Smita P et al(Mumbai,2017)	74.3%	15.90%	4.7:1
3	Present Study, Rajkot, 2025	81.59%	18.40%	4.4:1

As shown in table 8 in the present study ratio of Non-neoplastic to Neoplastic lesions was 4.1:1 which is very near to the findings of Hirachand et al,[4].4:1 and Smita P et al,[4].7:1.

CONCLUSION

Many of the lesions having lymphadenopathy can be successfully identified using Fine Needle Aspiration Cytology (FNAC). In the current study, the most common causes were Tuberculous lymphadenitis, non-specific and reactive hyperplasia and metastatic malignancies. FNAC, when combined with clinical correlation, serves as an effective first-line investigation in the diagnostic workup of lymph node lesions. It facilitates early diagnosis, minimizes the need for more invasive procedures, and guides appropriate further management. Further management depending upon the cause can be suitably guided by this simple, cost effective procedure.

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