

Research Article

Utility of FNAC as a Diagnostic Role in Lymphadenopathy Cases of Different Age Groups

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ABSTRACT

Background: Fine-needle aspiration cytology (FNAC) is a simple diagnostic tool to diagnose causes of lymphadenopathy. The cytologic patterns of lymph node fine needle aspirations (FNAs) show signs of a wide variation in different diseases. In the present study, we study the cytologic patterns of lymph node sequence of different age groups.

Methods: The present study was conducted in the Department of Pathology, GSVM Medical College, Kanpur. The total number of cases 1681 with lymphadenopathy was taken for this study. Routine investigations, which included complete blood counts, biochemical tests, X-Ray chest (PA View), Ultrasound/ CT scan (If indicated). FNAC was done and the slides were stained with Haematoxylin and Eosin stain, Giemsa stain and Ziehl-Neelsen stain (if indicated).

Results: In the present study, the commonest site of involvement was the cervical lymph node 1196 (71.15%). Overall benign lesions were 1575 (93.69%) and malignant lesions 106 (6.31%). In benign lesions, Tubercular lymphadenitis was the most frequently encountered lesion 934 (55.56%) followed by reactive hyperplasia 310 (18.44%). FNAC is a simple procedure and no hospitalization or anaesthesia is required.

Conclusion: FNAC is a safe, inexpensive repeatable and rapid procedure in which no anaesthesia is required. FNAC is useful as an outdoor diagnostic procedure because of early diagnosis in comparison to histopathological diagnosis.

Key-words: Cervical lymph node, FNAC, Lymphadenopathy, Metastatic, Reactive Hyperplasia, Tuberculous Lymphadenitis

INTRODUCTION

Lymph nodes play a major role in the host defense system as not only cleans and filter lymph but also produce lymphocytes and antibodies. The term lymphadenopathy refers to lymph nodes, which are abnormal in size, number or firmness ^[1]. Depending on the locations draining particular topographic regions, they are grouped as cervical, axillary, supra-clavicular, auricular, inguinal, sub-mental lymph nodes and so on ^[2]. The etiology of lymphadenopathy varies from infectious, autoimmune disease, metabolic disease, malignancies etc.

Enlarged lymph nodes are easily approachable for fine needle aspiration and hence FNAC is a simple and important diagnostic tool for lymphadenopathy. Lymphadenopathy is most commonly seen in extrapulmonary tuberculosis and tuberculous lymphadenitis is the frequent cause of peripheral lymphadenopathy ^[3]. Rapid strides in the technical advancement of FNAC has made it very easier to diagnose most of the lesions of lymph nodes has reduced otherwise time-consuming and invasive open biopsy of lymph nodes. FNAC is a simple procedure, which is a safe rapid and inexpensive and relatively less invasive method that could be carried out as an outdoor procedure without anaesthesia for establishing the diagnosis of pathological lesions occurring in lymph nodes on the exposed, easily accessible regions of the body ^[4,5]. This study was undertaken with the aim of highlighting the pattern of lymphadenopathy on FNAC.

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MATERIALS AND METHODS

Study duration- Duration of study was from January 2018 to September 2019. The total number of cases included 1681 of lymphadenopathy in the Department of Pathology in collaboration with Department of Medicine, ENT, Paediatrics, Surgery, TB chest and Oncology, G. S. V. M. Medical College, Kanpur and associated hospital Kanpur, India.

The study group includes patients of different age groups suffering from various diseases attending OPD, referred for the FNAC of enlarged lymph nodes in the department of pathology. The patient was explained about the procedure and informed consent was taken. The 20 ml disposable syringe was attached to a 22 gauge needle; the lymph node was palpated, localized and fixed between two fingers. The overlying skin was swabbed by rectified spirit. The needle was inserted into the palpable lymph node. A vacuum was created by withdrawing piston of the syringe. The vacuum was maintained while repeated runs in different directions in the palpable lymph node. The needle along with syringe was withdrawn together. The aspirated material was squirted onto the clean glass slides and smears were prepared by pulling apart two slides. The slide was fixed in fixative containing 95% alcohol and diethyl ether and stained with two methods viz. Haematoxylin & Eosin stain and Giemsa stain. If necessary, then Smear was also stained by ZN stain.

RESULTS

In the present study, FNAC was performed on 1681 patients. Table 1 shows that 751 patients were male and 930 patients were female. The proportion of male to the female patient was 1: 1.24. The maximum numbers of cases were detected in the age range of 11–20 years (28.37%), followed by the age group 21–30 years (24.98%). The total number of lymphadenopathy cases detected in the age range of 0–10 years was 19.69%.

Table 1: Distribution of cases according to age group and sex incidence

Age Group (years)	Sex		Percentage (%)
	Male	Female	
0-10	200	131	19.69
11-20	198	279	28.37
21-30	114	306	24.98
31-40	77	106	10.89
41-50	67	57	7.38

51-60	51	38	5.29
61-70	37	10	2.80
71-80	7	2	0.54
81-90	0	1	0.06
Total	751	930	100

In this study, the most common site was the cervical lymph node (71.15%), followed by sub-mandibular (7.73%), and axillary (5.77%) lymph node. In cervical lymph nodes, most of the cases had posterior cervical lymphadenopathy (65.8%) followed by upper anterior cervical lymphadenopathy (5.35%) (Table 2).

Table2: Anatomical Distribution of Enlarged Lymph Nodes

Site	Total	Percentage (%)
Cervical lymph node	1196	71.15
Sub-mandibular	130	7.73
Axillary	97	5.77
Supra-clavicular	97	5.77
Inguinal	67	3.99
Sub-mental	61	3.63
Auricular	31	1.84
Mesenteric	1	0.06
Pelvic	1	0.06
Total	1681	100

In this study, 751 patients were male and 930 patients were female. Reactive hyperplasia of lymph node more commonly affect male 178 cases (57.42%) as compared to female 132 cases (42.58%). Male to female ratio was 1.35: 1. Tubercular cases more commonly affect female 425 cases (65.89%) as compared to male 220 cases (34.11%). Male to female ratio was 1: 1.93 (Table 3).

Table 4 shows the reactive hyperplasia of lymph node more commonly seen in the age range of 0–10 yrs accounting to 50.79% of cases, followed by 11–20 yrs age range of accounting to 30.60% cases. Tubercular cases most commonly detected in the age range of 21–30 accounting to 220 (34.11%) cases followed by in the age range of 11–20 yrs accounting to 191 (29.61%) cases. Out of 99 cases of metastatic carcinoma, 36 cases (36.36%) was in the age range of 51–60 yrs, followed by 23 cases (23.23%) of age range of 61–70 yrs, followed by 23 cases (23.23%) age range of 61–70 yrs and 21 cases (21.21%) age range of 41–50 yrs.

Table 3: Gender wise distribution of patients according to cytological diagnosis

FNAC Diagnosis	Sex		Total
	Male	Female	
RHLN	178	132	310
CL	78	94	172
TB Abscess	97	156	253
TBLN with Extensive caseation	22	48	70
TB LN	101	221	322
CGL	54	53	107
CGL with strong possibility of TB	81	158	239
Necrotizing Lymphadenitis	4	5	9
Necrotizing Lymphadenitis with strong possibility of TB	22	28	50
Organized Abscess	12	7	19
RHLN with sinus histiocytosis	5	2	7
Metastatic carcinoma	80	19	99
Atypical hyperplasia of LN	17	7	24
Total	751	930	1681

L= Chronic lymphadenitis, CGL= Chronic granulomatous lymphadenitis, TBLN= Tubercular lymphadenitis, RHLN= Reactive Hyperplasia of lymph node

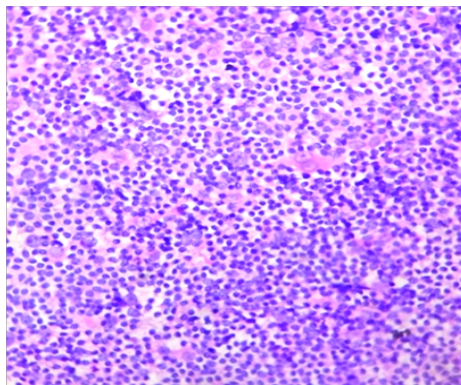
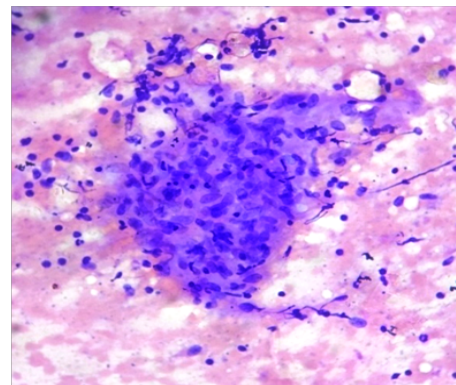
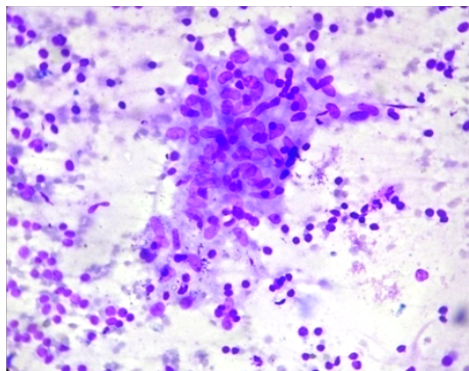
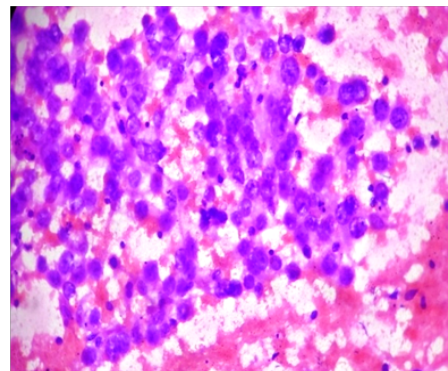
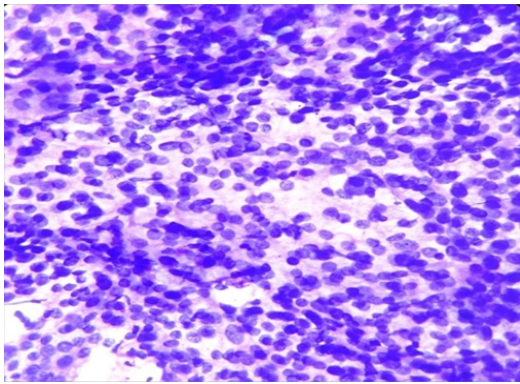
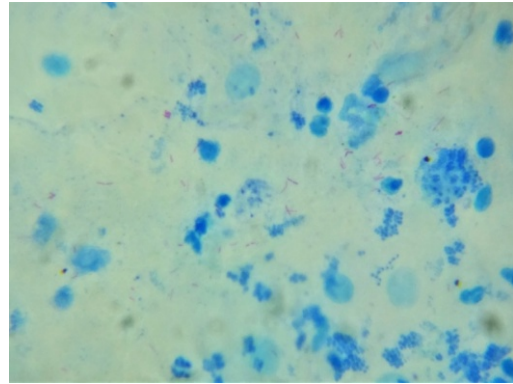
**Fig. 1A:** Reactive hyperplasia of lymph node (40x H&E)**Fig. 1B:** Photomicrograph of aspiration smear of tubercular lymphadenitis (40x H&E)**Fig. 1C:** Chronic granulomatous lesion with possibility of tubercular lymphadenitis (40x Giemsa)**Fig. 1D:** Poorly Differentiated squamous cell carcinoma with cystic changes with a strong possibility of adenosquamous carcinoma (40x Giemsa)

Table 4: Age-wise distribution of patients according to cytological diagnosis

FNAC Diagnosis	Age group (Years)								
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90
RHLN (with sinus histiocytosis)	161	97	34	11	7	4	2	1	0
CL	59	48	35	9	13	6	1	1	0
TB Abscess	30	59	88	38	21	13	2	2	0
TB LN	25	105	108	50	24	8	1	0	1
TBLN with Extensive caseation	5	27	24	10	3	0	1	0	0
CGL	13	45	30	10	3	4	2	0	0
CGL with strong Possibility of TB	21	75	77	29	19	9	9	0	0
Necrotizing Lymphadenitis	3	0	2	0	3	0	1	0	0
Necrotizing Lymphadenitis with Strong Possibility of TB	3	15	13	9	4	4	2	0	0
Atypical hyperplasia of LN	8	4	3	2	3	3	1	0	0
Organized Abscess	3	2	3	3	3	2	2	1	0
Metastatic carcinoma	0	0	3	12	21	36	23	4	0
Total	331	477	420	183	124	89	47	9	1

**Fig. 2:** Poorly Differentiated Squamous cell carcinoma (40X H&E)**Fig. 3:** Photomicrograph of Ziehl Neelsen Staining of Aspiration smear of tubercular abscess (100x ZN)

Out of 1681 cases of lymphadenopathy, 1575 cases (93.69%) of benign pathology and 106 cases (6.31%) of malignant pathology found. In out of 1575 benign cases, 664 cases (42.16%) were of male and 911 cases were (57.84%) of female and male to female proportion was 1: 1.37.

Out of 106 cases (6.36%) malignant cases, 87 cases (82.08%) were of male and 19 cases (17.92%) were of female. Male to the female proportion was 4.58: 1 (Table 5).

Table 5: Distribution of benign and malignant cases according to sex

Nature of Lesion	Percentage (%)	Male (%)	Female (%)	Ratio (M: F)
Benign	93.69	664(42.16)	911(57.84)	1: 1.37
Malignant	6.31	87(82.08)	19(17.92)	4.58: 1
Total		751	930	

DISCUSSION

Enlarged lymph nodes are accessible for FNAC to diagnose primary or secondary malignancies and benign lesion. Cases of lymphadenopathy are most commonly seen in 11–20 yrs age group and its range was 28.37%. This finding was correlated by Agarwal *et al.* [6] and also a correlation with study given by Arun *et al.* [7] Nirmal *et al.* [8] and Patro *et al.* [9]. The proportion of male to female patients in our observation was found to be 1: 1.24. This finding is correlated to past study that given by Nirmal *et al.* [8]; Patro *et al.* [9]; and Mane *et al.* [10]. Our study correlates lymphadenopathy was seen in most commonly in the cervical region (71.15%) and other similar studies lymphadenopathy was most commonly seen in neck region i.e. 93.73% [11] and 72.5% cases of cervical in which FNAC was performed given by Ikram *et al.* [12]. The cervical lymph node was the most frequently affected group of lymph nodes accounting to 74.24% similar observations also given by Patro *et al.* [9]; Farooq *et al.* [13] and Nur *et al.* [14].

In the present study, 93.69% of cases were of inflammatory lesion of the lymph node. Out of inflammatory lesions, the most common lesion was tubercular lymphadenopathy accounting to 55.5% cases, reactive hyperplasia of lymph node accounts for 18.86% cases. Most common causes of lymphadenopathy were found to be tuberculous lymphadenitis with 32.12% cases given by Patro *et al.* [9]. Florence *et al.* [15] stated that 35.9% case tubercular lymphadenitis was found, which is most frequent than other cases. In our study metastasis is most commonly seen in the cervical lymph node, which is similar to results of other studies given by Nirmal *et al.* [8] and Florence *et al.* [15].

In our study, males were most commonly affected by reactive hyperplasia of lymph node; proportion of male to female was 1.35: 1. Whereas, females are most commonly affected by tubercular lymphadenopathy; the proportion of male to female was 1: 1.93. Our study was shown similar result by some previously published studies by Farooq *et al.* [13]; Nur *et al.* [14]; Badge *et al.* [16] and Bhatta *et al.* [17]. In our study, tubercular lymphadenopathy cases are most commonly seen in the age range of 21–30 years accounting 34.11% followed by the age range of 11–20 years accounting to 29.61%, cases. Correlate to the past studies that observed by some previous studies, given by Agarwal *et al.* [8]; Nur *et al.* [14]; Badge *et al.* [16] and Mainali *et al.* [18].

In our study metastatic carcinoma was most commonly seen in the age group i.e. 51–60 yrs (36.36%) followed by 61–70 yrs age range (23.23%). Khajuria *et al.* [5] found that after 4th decades overall percentage of metastatic carcinoma was 88%. Agarwal *et al.* [6]; Mane *et al.* [10] and Nikethan *et al.* [19] stated that metastasis was seen in the middle and elderly age group. In our observations, 16.27% of cases of tubercular lymphadenitis were AFB positive on Z-N staining but Badge *et al.* [16] stated that AFB positive in 28.47% cases of tubercular lymphadenitis with the closed result. Overall AFB positive 32.4% of cases in tubercular lymphadenitis observed by Bhatta *et al.* [17].

CONCLUSIONS

Our study show cased, the usefulness of FNAC in reaching a prompt diagnosis in patients presenting with lymphadenopathy and also put light on etiology and pattern of lymphadenopathy. FNAC is a safe inexpensive rapid procedure in which no anaesthesia required. FNAC is useful as an outdoor diagnostic procedure because of early diagnosis in comparison to histopathological diagnosis.

Fine Needle Aspiration Cytology finding should be correlated with the histopathological finding.

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Data collection- Dr. Jaivijay Tiwari

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Writing article- Dr. Jaivijay Tiwari

Critical review- Prof. Mahendra Singh

Article editing- Dr. Jaivijay Tiwari

Final approval- Prof. Mahendra Singh

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