Original article

ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY TO ANALYZE VARIOUS CAUSES OF LYMPHADENOPATHY

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ABSTRACT

Background: Fine needle aspiration cytology (FNAC) is a simple and reliable technique for study of various causes of lymphadenopathy.

Aims: To study cytomorphological patterns of FNAC of lymph nodes and its utility in establishing diagnosis of lymphadenopathy.

Methods: Total 580 cases of the lymph node FNAC were studied from May 2011 to April 2012 in Cytopathology department of Government Medical College, Surat.

Results: Maximum numbers of cases were in the age group of 21-30 years. The most common lesion encountered was tuberculous lymphadenitis (50.52%) followed by metastatic tumours (27.06%), reactive lymph node (14.66%), acute lymphadenitis (5%) and lymphoma (2.76%) respectively.

Conclusion: FNAC is safe, rapid and cost-effective method in establishing the diagnosis in large number of cases of lymphadenopathy.

Keywords: Fine needle aspiration cytology, lymphadenopathy, Tuberculosis

INTRODUCTION

Lymphadenopathy is a commonly encountered clinical problem which has a multitude of causes.[1] Enlarged lymph nodes were the first organs to be sampled by fine needle aspiration (FNAC).[2] Since FNAC lends itself to outpatient diagnosis, it is eminently suited for use in peripheral medical centres. It is safe, nontraumatic, repeatable and inexpensive.[3] Diagnosis of lymphadenopathy depends mainly on excision of a gland and histopathological examination. For this, general anaesthesia and hospitalisation are required. Fine needle aspiration cytology, on the other hand, is free from these disadvantages and can safely be used as an alternative or complementary investigative technique.[4] FNAC is highly cost effective and accurate as a first line investigative technique with differential diagnoses including reactive hyperplasia/inflammatory conditions, granulomatous disorders, lymphoma and metastasis, stratifying cases requiring further investigations, surgical intervention or clinical follow-up.[5] Here, we report our experience of 580 cases of Lymphadenopathy diagnosed by FNAC.

MATERIAL AND METHOD

The prospective study of Fine needle aspiration cytology in Lymphadenopathies was conducted between May 2011 to April 2012 at Department of Pathology, Government Medical College and New Civil Hospital, Surat.

Total 580 cases were studied. Aspiration was done by using 22-24 gauge disposable needle and 10 ml syringe, and prepared slides were stained with May Grunwald Giemsa (dry fixation), Papanicolaou (wet fixation) and Hematoxylin and Eosin (wet fixation), along with ZN staining in suspected tuberculous patients. Cytomorphological features like the overall cell population, predominant pattern were assessed by examination under low power. Then the individual cell morphology was studied under high power. The ZN stain was defined as positive if one or more AFB was seen and negative if no AFB was seen in 100 oil immersion fields of smears. Final smear was reported after correlating the clinical data and other investigations.

RESULTS

Total 2355 cases were obtained in cytopathology section in the one year, out of which 580(24.63%) cases were lymph node FNACs. The range of age of patients was from 1 to 80 years and the mean age was 40.5years. The maximum numbers of cases were in the age group of 21-30 years (22.93%). In the present study, 328 cases (56.55%) were male while 252 cases (43.45%) were females (Male: Female=1.3:1).

Table 1: Distribution of cases in relation to Age

Age group (Yrs)	Benign Lymphadenopathies			Lymphoma		Mets. Tum.**	Total Cases (%)
	Acute lym.*	Reac. Hyper.†	TB Lym.‡	HL§	NHL¶		
0-10	9	29	24	2	0	1	65 (11.21)
11-20.	6	21	87	0	1	2	117 (20.17)
21-30	5	17	103	1	3	4	133 (22.93)
31-40	4	11	52	0	3	33	103 (17.76)
41-50	3	4	13	0	0	45	65 (11.20)
51-60	1	2	4	1	0	32	40 (6.90)
61-70	1	1	7	0	2	30	41 (7.07)
>70	0	0	3	0	3	10	16 (2.76)
Total	**29**	**85**	**293**	**4**	**12**	**157**	**580 (100)**

*Acute lymphadenitis, †Reactive hyperplasia, ‡Tuberculous lymphadenitis, §Hodgkin lymphoma, ¶Non Hodgkin lymphoma, ** Metastatic tumor

Maximum no. of cases of Acute Lymphadenitis and Reactive Hyperplasia were in 0-10 yrs age groups (table 1). Maximum no. of cases of TB Lymphadenitis and Lymphoma were in 21-30 yrs age groups. Maximum cases of Metastatic tumors were in 41-50 yrs age groups. TB Lymphadenitis were more common in females (Male: Female=1:1.1) while Metastatic tumors were more common in males (Male: Female=2.8:1).

Table 2: Regional distribution of cases

Site of FNAC of Lymph node	Cases (n=580) (%)
Cervical	487 (83.97)
Axillary	48 (8.28)
Inguinal	34 (5.85)
Generalized	11 (1.90)

Maximum numbers of aspiration were performed from cervical region (83.97%), followed by Axillary region (8.28) and inguinal region (5.85). In 11 cases (1.90), aspirates were obtained from two or more groups of lymph nodes and were considered to be generalized lymphadenopathy. In Table 3 various causes of Lymphadenopathy were classified according to cytomorphological patterns. From the table no.3, it can be seen that Tuberculous Lymphadenitis was single largest group having 293 cases, making up 50.52% of the study cases.

Table 3: Distribution of various lesions on FNAC

FNAC diagnosis	Cases (n=580) (%)
Benign Lymphadenopathies	
Acute Lymphadenitis	29 (5)
Reactive hyperplasia	85 (14.66)
Tuberculous Lymphadenitis	293 (50.52)
Malignant Lymphoma	
Hodgkin's lymphoma	4 (0.69)
Non Hodgkin's lymphoma	12 (2.07)
Metastatic tumors	157 (27.06)

As shown in Table 4, predominant cytomorphological pattern was Epithelioid cell granulomas with caseous necrosis (64.85%). Out of 293 cases, in 93 cases AFB was positive (31.74%)which was seen maximum in third group with Caseous necrosis only(50%), followed by second group with Epithelioid cell granulomas with caseous necrosis (43.16%) and least AFB positivity was seen in first group with Epithelioid cell granulomas without caseous necrosis(2.35%).

Table 4: Cytomorphological features in TB lymphadenitis correlating with AFB positivity

Cytomorphological features	Cases (%)	AFB Positive (%)
Total	**293**	**93(31.74)**
Epithelioid cell granulomas without caseous necrosis	85 (29.01)	2(2.35)
Epithelioid cell granulomas with caseous necrosis	190 (64.85)	82(43.16)
Caseous necrosis without granulomas	18 (6.14)	9(50.0)

Maximum cases yielded blood mixed aspirate (52.56%) followed by cheesy(26.97%) and purulent(20.47%) aspirates.AFB positivity was maximum in cheesy aspirate(50.63%) followed by purulent aspirate(48.33%) and least in blood mixed aspirate(15.58%). The maximum no. of HIV positive cases were in the age group of 31-40 yrs (Male: Female=1:1).Out of 30 HIV positive cases, in 24cases TB lymphadenitis was predominant lesion (80%). Out of 24 cases, in 11 cases AFB was positive (45.83%) which was seen maximally in pattern of caseous necrosis only (75%). Out of 157 cases of metastatic tumors, maximum cases were metastatic squamous cell carcinoma (118 cases-75.15%).

DISCUSSION

Fine needle aspiration cytology is a simple, safe, inexpensive and reliable investigative procedure. With the recent advances in ultrasound and CT scan technologies, deep lesions can be aspirated using these procedures and helps in preventing surgical intervention, staging of tumors along with diagnosis and prognosis of tumors in adjunct to Immunocytochemistry. FNAC of lymph nodes is one of the routinely used diagnostic procedures in patients presenting with lymphadenopathy. In experienced hands, the reliability and accuracy of FNAC is very high.

The age group which was studied ranged from 1-80 yrs with maximum cases in age group 21-30 yrs which is comparable with those of Shreshtha et al[6], A. B. Pandav et al[7] and A. K. Kochhar et al[8]. However, Sulaiman et al [9] found maximum no. of cases in the age group 11-20 yrs. This variation may be due to different population density or geographic variation.

In present study a male preponderance was noted. Similar male preponderance was noted by Hirachand et al [10], Shreshtha et al [6], A B Pandav et al [7] and A K Kochhar et al [8].

The most frequent site for FNAC was cervical region (83.97%) followed by axillary region (8.28%). Similar findings were also observed by A K Kochhar et al [8], Sulaiman et al [9], Hirachand et al [10] and Ruchi et al[11].

The most common cytological diagnosis was Tuberculous Lymphadenitis (50.52%) in present study. Similar findings were observed by A B Pandav et al[7], A K Kochhar et al[8] and Ruchi et al[11]. Tuberculous Lymphadenitis is one of the most common type of lymphadenopathy in developing countries. The high rate is due to low socio-economic status, illiteracy, incomplete treatment, resistance and increased incidence of HIV infection. However, Lakhey et al [12] found Reactive hyperplasia as the most common cytological diagnosis. This difference may be due to different study population and more HIV positive cases coming to our hospital as we have VCTC (voluntary counseling and testing centre).

In present study, second most common cytological diagnosis was Metastatic tumors (27.06%). Similar findings were also observed by A B Pandav et al [7].However, A K Kochhar et al [8] and Ruchi et al [11] found reactive hyperplasia as the second most common cytological diagnosis. It was may be due to different study population, genetic factors, environmental factors and habitual factors like smoking and tobacco consumption. Also because our hospital is tertiary care centre and we get plenty of referred cases. So we get more cases of metastatic malignancy in lymph node.

Predominant Cytomorphological pattern was Epithelioid cell granulomas with caseous necrosis (64.85%) in present study, which was comparable to findings of A B Pandav et al[7] (45.8%), Lakhey et al[12] (46.7%) and Goswami et al[13] (50%). However, Paliwal N et al [14] found necrosis without granulomas (69.3%) as the most predominant cytomorphological pattern.

In the present study, AFB positivity was maximum with necrosis without granulomas pattern (50%) followed by epithelioid cell granulomas with necrosis pattern (43.16%). So our findings were comparable to findings of Lakhey et al[12], Goswami et al[13] and Paliwal N et al [14]. Maximum AFB positivity 50.63% was found in cases where cheesy material was aspirated followed by purulent aspirate having AFB positivity 48.33% and least AFB positivity15.58% was found with blood mixed aspirate. Thus our findings correlate with

other study of Goswami et al [13]. However, Paliwal N et al [14] and Dev prasoon [15] found purulent aspirate showed maximum AFB positivity.

Dev prasoon [15] observed that the relation between granulomas and AFB was inverse. Predominantly granulomatous reaction with little or no coexistent necrosis would be associated with the presence of few or no AFB, while a predominantly necrotic reaction with few or no coexistent granulomas would be expected to show more AFB. The AFB detection rate in cheesy aspirate was less than that in purulent aspirate due to more frequent presence of granulomas in cheesy aspirate. Thus it appears that the chance of finding AFB is greater in pus or cheesy aspirate than blood mixed aspirate.

Out of 157 cases of metastatic tumors, maximum cases were metastatic squamous cell carcinoma (75.15%) followed by mammary carcinoma (8.29%). Our findings were correlated with other studies[7- 8].

CONCLUSION

Fine Needle Aspiration Cytology (FNAC) is an accurate diagnostic technique in diagnosing various etiologies of lymphadenopathies. FNAC provides a reliable, safe, rapid and economical method of investigating lymph node enlargement, the accuracy of which approaches that of other diagnostic procedures. Most of lymphadenopathies are due to non-neoplastic conditions. Lymph node cytology is useful for segregating lymphadenopathy cases that need further evaluation and is a valuable tool for diagnosis of neoplastic and non-neoplastic lesions. It may replace unnecessary surgical procedures in many cases. FNAC diagnosis will help the clinician to confirm or exclude the clinical differential diagnosis made at first visit of the patient to the OPD. Speedy cytological diagnosis helps the clinician to further plan the treatment. In each case of suspected tuberculosis, FNA smear should be stained by Z-N method which is a simple, fast and cheap method and early diagnosis can be made, so that treatment can be initiated early. FNAC is a primary, easy and effective diagnostic modality for HIV lymphadenopathy patients. For the diagnosis of lymphoma, it can suggest a preliminary diagnosis, followed by histopathology and immunohistochemistry for confirmation. FNAC may be the only tool in the diagnosis of metastatic lesions in the lumph nodes and can help to detect occult primary malignancies.

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