FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSIS OF LYMPHADENOPATHY ASSOCIATED WITH TUBERCULOSIS

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ABSTRACT: **BACKGROUND:** Tuberculosis remains most common infectious disease in the developing world. Cytomorphological studies with detection of acid fast bacilli prove to be valuable diagnostic method in case of tuberculosis lymphadenopathy.

AIMS: To study the various cytomorphological patterns of tuberculous lymphadenopathy and role of Ziehl-Neelsen stain (ZN) to detect acid fast bacilli (AFB).

MATERIAL AND METHOD: This study was descriptive, cross-sectional and analytical, conducted at Krishna hospital and medical research centre, tertiary care and rural hospital from a period of January 2014 to December 2014. Patients with lymphadenopathy having clinical suspicion of tuberculosis were referred to Pathology department for cytopathological evaluation. Clinical presentation, routine investigations and fine needle aspiration cytology (FNAC) smear study with Hematoxylin and eosin, Giemsa and Ziehl-Neelsen stain was done.

RESULT: In this study total 135 patients of lymphadenopathy were studied for aspiration cytology. Incidence of tuberculous lymphadenitis was noted in 52 cases (38.51 %). The cervical group of lymph node enlargement was most common site. Most patients presented in 21 to 30 years of age group with M:F ratio 1.2:1. The most common cytological feature was epithelioid granuloma without necrosis was in 25 cases (48.07%). Others were epithelioid granuloma with caseous necrosis in 16 cases (30.76%), necrosis without granuloma in 6 cases (11.52%) and polymorphs with necrosis with/ without epithelioid granuloma seen in 5 cases (9.61%).AFB positivity was noted in 17 cases (32.69%).

CONCLUSION: FNAC is a very important investigation in diagnosis of tuberculous lymphadenitis, if it is supported with ZN stain for AFB will help to confirmatory diagnosis of the disease and for better management of the patients.

KEYWORDS: Tuberculous lymphadenitis, FNAC, Mycobacterial infection

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INTRODUCTION: Tuberculous infection still remains a major health problem in developing countries.[1] Every year 8 million new cases of tuberculosis are seen, with about 2 millions death related to it.[2] Tuberculos infection has wide spread involvement, commonest being pulmonary. For extra pulmonary lesion the lymph node involvement is very common cause of superficial lymphadenopathy. FNAC is an easy, simple, cost effective procedure to aspirate material for cytomorphological and bacterial examination.[3]

MATERIALS AND METHOD: The study was conducted at the KIMSU hospital, Western Maharashtra, in clinically suspected cases to be of tuberculosis.

Aspiration for cytological evaluation was done in 135 patients of consecutive cases from superficially enlarged Lymph node.

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The study was done from January 2014 to December 2014. This study design was retrospective and prospective, cross sectional, analytic and observational type. Detail clinical examination and relevant investigations were carried out. FNAC was performed on all patients with informed consent. Aspiration was done by using a 20-23 gauge needle and disposable 10ml plastic syringe. Air dried smears were stained by May Grunwald-Giemsa stain, while alcohol fixed smears were stained by papnicolaou (PAP) and hematoxylin –eosin stain. Special stain for acid fast bacilli was done with 20% ZN stain. All smears were evaluated for cytomorphologial features by cytopathologist. Excisional biopsy of lymph nodes was studied wherever required. The cytological smear revealing features of tuberculous lymphadenitis were group according to Heerde PV, et al[4] into:

1. Epithelioid granulomas with caseous necrosis.
2. Epithelioid granulomas without necrosis.
3. Necrosis without epithelioid granuloma.
4. Polymorphs with necrosis with/without epithelioid granuloma.

RESULTS: Total of 135 superficial lymph node were aspirated, 52 cases showed cytomorphological features of tuberculosis. They were categorized in 4 types (Table-1).

The tuberculous lesion was common in male with M; F ratio 1.2:1. The age distribution was shown in Table-3), showed age group between 21-30 year was commonest. Site wise (Table-2) cervical group of node was most commonly involved (71.15%) followed by axillary and inguinal. The bilateral or generalized lymphadenopathy was noted in 2 cases. Matting of lymph node was seen in 3 cases. AFB positivity was found in 32.69% cases (Table-4).

DISCUSSION: Tuberculous lymphadenitis is one of the most common type of lymphadenitis seen in developing countries.[5,6] The high rate of tuberculous lymphadenitis in our country is related to low socio-economic status, illiteracy, poor health education, incomplete treatment, resistant to treatment and increase incidence of HIV infection.[7]

In our study tuberculous lymphadenitis was most frequently seen in age group of 21-30 years 14 cases (26.92%). The male predominance with M:F ratio 1.2:1. The cervical lymphadenitis was most common site to involved 37 cases (71.15%) followed by axillary (19.23%) and inguinal (9.61%) nodes. Cervical lymphadenopathy was most common site, which was also noted in observation by Ahmad SS, et al[8] (60%), Bezabih M et al [9] (74%), Sharma C, et al[10] (88%). Considering overall prevalence in Indian population, the presence of epithelioid cell granuloma is indicative of tuberculosis. So the commendation is that even case of granulomatous inflammation seen on aspiration cytology should be studied to differentiate tuberculosis from other granulomatous diseases by special stain like; ZN, Giemsa or PAS. It will increase diagnostic accuracy. Also when lymphadenopathy shows cheesy material, it can be consider strongly for tuberculous lymphadenitis.

On cytomorphological evaluation out of 52 cases in our study smears showed epithelioid granuloma with caseous necrosis in 30.76% cases (Fig. 1), epitheiloid granuloma without necrosis in 48.07% of cases (Fig. 2), necrosis without epithelioid granuoma in 11.52% cases (Fig. 3) and polymorphs with necrosis with/ without granuloma in 9.61% cases (Fig. 4). The AFB positivity was found in 17 cases (32.69%) (Fig. 5). In our study of tuberculous lymphadenitis categories, in which necrosis and suppuration was evident, showed more positivity. While epithelioid granuloma had less AFB positivity. In study by Ergete et al[3] showed 71.7%, Bezabih et al[9] 59.4%, Dasgupta et al[11] 45.6% and Aggrawal et al[12] 19.6% AFB positivity. Aspiration from lymph node of early stage of tuberculosis usually shows non-specific reactive changes and low bacterial sensitivity, while in later stages where necrosis is acute suppurative pattern is more, and the AFB positivity is higher.[13] AFB is usually detected in degenerated areas, within or at periphery of granulomas and mostly extracellular. Morphology of these bacilli was short and stumpy rods with red beaded appearance (Fig. 5) 20% ZN stain also immunocompromised patients mostly related with HIV/AIDS, lymphadenopathy show higher possibility of AFB.

The various methods for diagnosing tuberculous lymphadenitis are cytomorphological features on FNAC, demonstration AFB in FNA smears with ZN or auramin-rhodamin stain, mycobacterial culture, amplification of bacterial DNA study by polymerase chain reaction (PCR), ELISA, etc. However in developing countries cost of such investigations and availability of recent techniques at different level is difficult. Therefore FNAC study with demonstration of AFB by ZN stain is the most widely used method.

CONCLUSION: FNAC remains safe, reliable, cost-effective and rapid outdoor diagnostic procedure for tuberculous lymphadenitis. Therefore FNAC finding of granulomatous inflammation and detection of AFB would be very specific and help physicians to start antituberculous treatment earlier.

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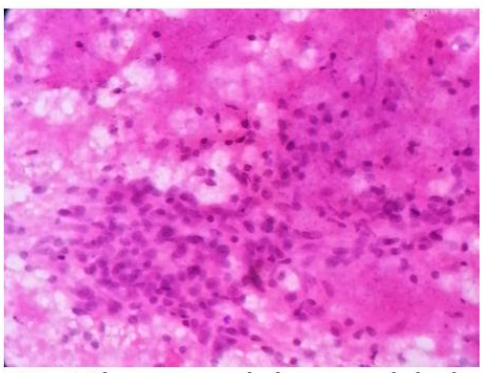

Fig. 1: Photomicrograph showing epithelioid granuloma with caseous necrosis (H & E stain, 400x)

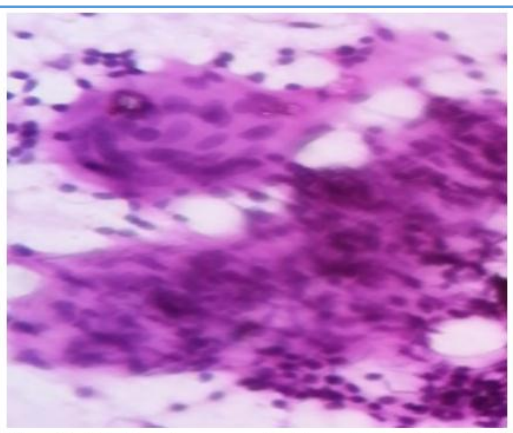

Fig. 2: Photomicrograph showing epithelioid granuloma without necrosis (H&E stain, 400x)

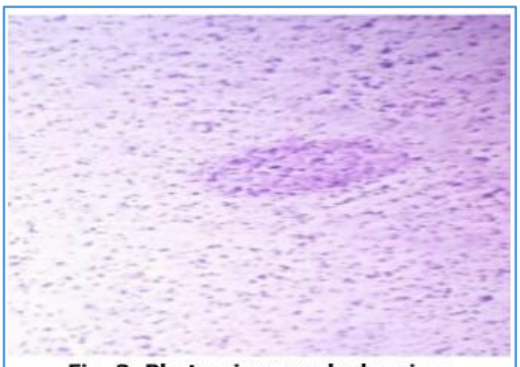

Fig. 3: Photomicrograph showing extensive necrosis (H&E stain, 400x)

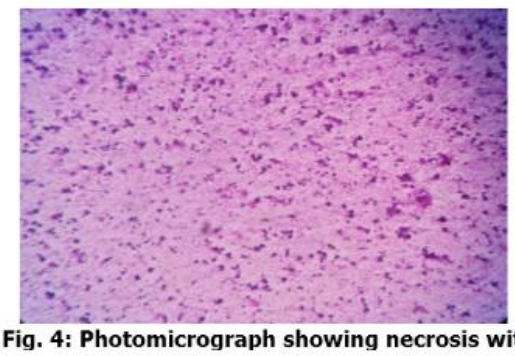

Fig. 4: Photomicrograph showing necrosis with polymorphonuclear cells (H&E stain, 400x)

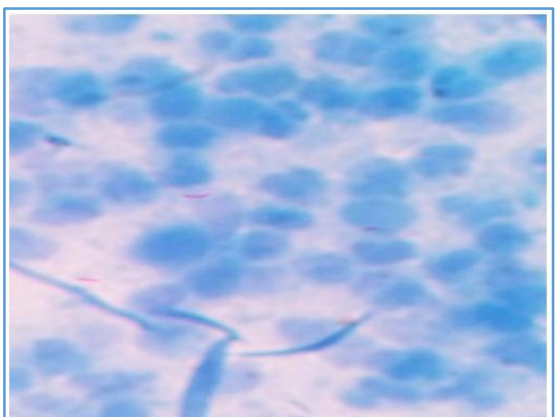

Fig. 5: Tuberculous lymphadenitis with acid fast bacilli (Z-N stain 20%, 1000x)

Types	Cases	%
Reactive hyperplasia	33	24.44
Non-specific inflammation	4	02.96
Tuberculous lymphadenitis		
a) Epitheiloid granuloma with caseous necrosis	16	11.85
b) Epithelioid granuloma without necrosis	25	18.51
c) Necrosis without epithelioid granuloma	6	04.44
d) Polymorphs with necrosis with/without epithelioid granuloma	5	03.70
Metastasis of lymph node	39	28.88
Lymph proliferative disorders	4	02.96
Other	3	02.22
Total	**135**	

Table 1: Distribution of lymphadenopathy on cytomorphological basis of various lesions

Site	Cases	%
Cervical	37	71.15
Axillary	10	19.23
Inguinal	5	09.61
Total	**52**	

Table 2: Distribution of tuberculous lymphadenitis according to site

Age of the patient	Cases	%
<10 years	2	03.84
11-20 years	6	11.53
21-30years	14	26.92
31-40 years	11	21.15
41-50 years	6	11.53
51-60 years	7	13.46
61-70 years	5	09.61
71-80 years	1	01.92
Total	**52**	

Table 3: Age wise distribution of tuberculous lymphadenitis cases

Cytomorphological Type	No. of Cases	%	AFB + smears
Epithelioid granuloma with caseous necrosis	16	30.76	11
Epithelioid granuloma without necrosis	25	48.07	3
Necrosis without epithelioid granuloma	6	11.52	1
Polymorphs with necrosis with/without epithelioid granuloma	5	09.61	2
Total	**52**		

Table 4: Distribution of tuberculous lymphadenitis on Cytomorphology