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Research Article

Evaluation of the Role of Fnac in Diagnosis of Tubercular Lympadenitis in Rural Setup in India

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Summary

Background: Tuberculous Lymphadenitis is one of the most common causes of lymph node enlargement in developing countries like India. However, anti-tubercular treatment cannot be given only on clinical suspicion. FNAC with special staining like AFB/ ZN staining proves to be an important , rapid and efficient diagnostic tool in diagnosing Tuberculous Lymphadenitis.

Aim: To study the utility of FNAC with Ziehl-Neelsen staining in diagnosis of tuberculous lymphadenitis.

Material and Methods: In a study period of one year, two hundred consecutive superficial lymph nodes, clinically suspected to be tuberculous were subjected to cytological evaluation with Hematoxylin & Eosin, Giemsa and Ziehl-Neelsen stained smears.

Results: Incidence of tuberculous lymphadenitis was 66%. Overall AFB positivity was 74.0%. Only Necrosis without epithelioid cell granulomas was the most common cytological picture and that showed highest AFB positivity also. 80% of the patients presented in second to fourth decade of life. Cervical region was the most common site of involvement with matted lymph nodes as the most common presentation in tubercular lymphadenitis.

Conclusions: Fine needle aspiration cytology is a reliable, safe and economical procedure requiring minimal intervention and is highly sensitive to diagnose tuberculous lymphadenitis. The sensitivity can be further increased by complementing cytomorphology with acid fast staining. In acid fast staining negative cases, yield of acid fast bacilli positivity can be increased by doing Ziehl-Neelsen staining on second smear or decolourized smear revealing necrosis or by repeat aspiration.

Key words: Tuberculous Lymphadenitis, FNAC with Ziehl-Neelsen staining

INTRODUCTION

India is the country with the highest burden of TB. The WHO TB Stastistics for India for 2015 give an estimated incidence figure of 2.2 Million cases of TB for India out of a global incidence of 9.6 million(1). An estimated 220,000 die from the disease (2). TB involoves respiratory tract as well as extrapulmonary sites, Lymph Node being the most common among the latter(3). TB Lymphadenitis is the most common form of extra-pulmonary TB(3). Since TB usually affects superficial Lymphnodes, FNAC is established as a reliable,cheap, simple, rapid, outpatient procedure for obtaining diagnostic material. The diagnosis is made by Cytomorphological features alongwith ZN Staining for AFB(4).

The aim of this study was to describe various cytomorphological features of tuberculous lymphadenitis with their relative frequency and to assess correlation between FNAC and Ziehl-Neelsen (Z-N) staining in diagnosing tuberculous lymphadenitis.

MATERIAL AND METHODS.

Two Hundred consecutive superficial lymph nodes, clinically suspected to be tuberculous, were aspirated for cytological evaluation after thorough clinical examination in a study period of one year. Aspirations were performed using 22 G needle and disposable 20 ml plastic syringe with a detachable syringe holder. In all the cases,alcohol fixed smears were made and stained with Hematoxylin & Eosin, one air-dried smear was stained with Giemsa stain, one smear was stained with Z-N technique and an additional slide was kept unstained for any further required stain. The cytology smears revealing features of tuberculous lymphadenitis were grouped into four categories:epithelioid granulomas with caseous necrosis,epithelioid granulomas without necrosis, necrosis only without epithelioid granulomas and polymorphs with necrosis with or without epithelioid granulomas.(5)

Table- 1 Spectrum of Lymphadenopathies in Males and Females

DIAGNOSIS	MALE	FEMALE	TOTAL
Tuberculous Lymphadenopathy	58	74	132
Reactive Lymph Node Hyperplasia	32	28	60
Metastasis	4	0	4
Lymphoma	2	2	4
Total	96	104	200

Table -2 Incidence of Tuberculous Lymphadenitis in relation to Age and Sex of the patients

Age				
1-10		6		6
11-20		18		21.2
21-30		30		38.0
31-40		14		21.2
41-50		4		9
51 and		2		4.6
Total	58	74	132	100

Table -3 Distribution of Lymph Node Groups Involved

Site	**Frequency**	**Percentage (%)**
Cervical	**172**	**86**
Axillary	**12**	**6**
Inguinal	**10**	**5**
Generalised	**6**	**3**
Total	200	100

Table-4 Frequency of Presentation of Lymph Nodes{ Overall}

Site	**Frequency**	**Percentage (%)**
Single Lymph Node	**104**	**52**
Matted Lymph Node	**80**	**40**
Multiple Unilateral	**10**	**5**
Multiple Bilateral	**6**	**3**
Total	200	100

Table-5 Frequency of Presentation of Lymph Nodes in Tuberculous Lymphadenitis

Site	**Frequency**	**Percentage (%)**
Matted Lymph Node	**70**	**53**
Single Lymph Node	**56**	**42**
Multiple Unilateral	**4**	**3**
Multiple Bilateral	**2**	**2**
Total	132	100

Table-6 Distribution of cases according to Cytomorphological Picture and AFB Positivity in Tuberculous Lymphadenitis

Cytomorphological Pictures	**Number of Cases**	**Percentage**	**AFB Positive Cases**	**AFB Negative Cases**
Epitheloid Granuloma with Caseous Necrosis	**20**	**15.1**	**14(70%)**	**6(30%)**
Epitheloid Granuloma without Necrosis	**18**	**13.6**	**4(22%)**	**14(78%)**
Necrosis Only without Epitheloid Granuloma	**54**	**41.0**	**48(89%)**	**6(11%)**
Polymorphs with Necrosis	**40**	**30.3**	**32(80%)**	**8(20%)**
Total	132	100	98(74%)	34(26%)

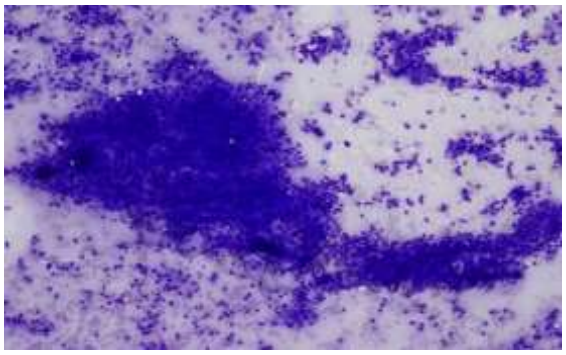

Figure 1: Epitheloid Granuloma without Necrosis[MGG, 40X10X]

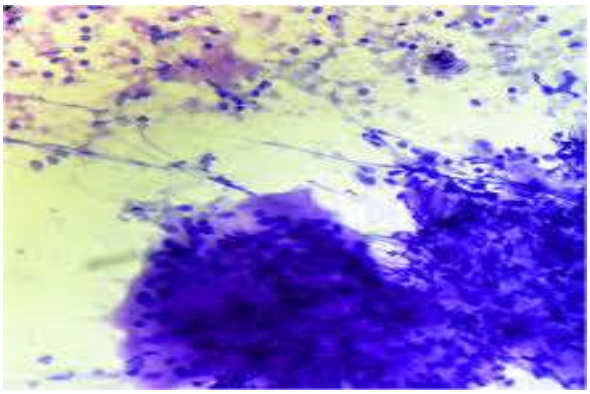

Figure 2: Epitheloid Granuloma in a necrotic background[H&E, 40X10X]

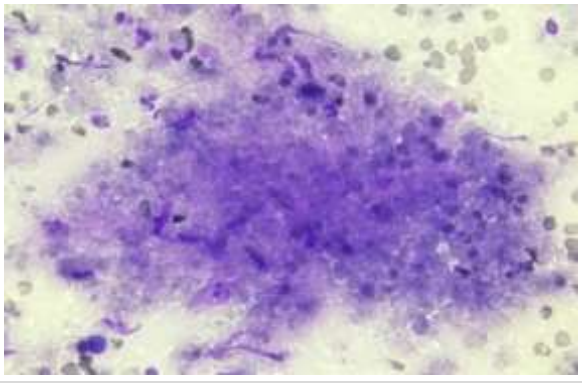

Figure3: Necrosis only without epitheloid granuloma[MGG, 40X10X]

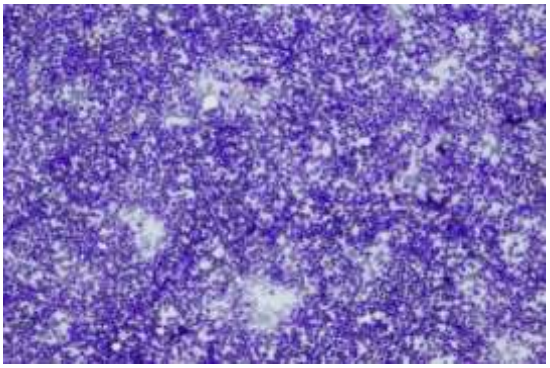

Figure 4: PMNs only without Granuloma[MGG, 40X10X]

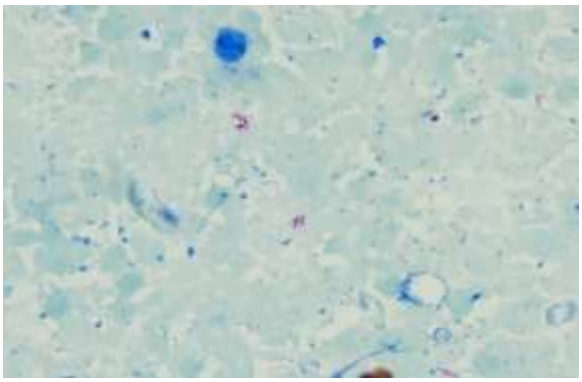

Figure 5: AFB Positivity[ZN, OIL]

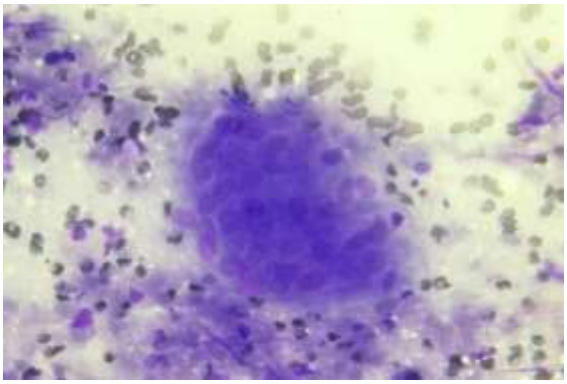

Figure 6. Giant Cell in Tuberculous Lymphadenitis [MGG, 40X10X]

RESULT:

Out of Two Hundred superficial lymphnodes aspirated,98 cases showed AFB positivity while 34 cases were AFB negative with cytological picture of tuberculous lymphadenitis, 60 cases revealed reactive lymphnode hyperplasia and 4 cases each of lymphomas and metastases were found(Table 1). Among tuberculous cases, 44% were of males and 56% were of females with male to female ratio of 1:1.28 (Table 2). The cervical region was the most common site; involved in 86% cases,followed by axillary (6%) and inguinal (5%). Only six (3%) cases presented with generalized lymphadenopathy(Table 3). In our study, most common presentation was single, palpable lymphnode in 52% of cases followed by matted lymph nodes in 40% of cases, multiple unilateral lymphadenopathy in 5% of cases and multiple bilateral in 3% of cases (Table 4). Further, amongst 132 tuberculous cases, matted lymphadenopathy was the most common presentation in 53%, followed by single lymphadenopathy in 42% of cases (Table 5).

Out of 132 cases showing cytological picture of tuberculous lymphadenitis, smears revealed epithelioid

granulomas with caseous necrosis in 15.1% of cases , epithelioid granulomas without necrosis in 13.6% of

cases, necrosis only without epithelioid granulomas in 41.0% of cases and polymorphs with necrosis with or without epithelioid granulomas in 30.3% of cases (Figs.1,2,3,4).

AFB positivity [Figure:5] was found in 70% of the cases showing epithelioid granulomas

with caseous necrosis, 22% of cases with epithelioid granulomas without necrosis, 89% of cases with

necrosis only without epithelioid granulomas and 80% of cases with polymorphs with necrosis with or without epithelioid granulomas (Table 6). Overall AFB positivity was seen in 74.0% cases.

DISCUSSION

Tuberculous Lymphadenitis is one of the most common causes of Lymphadenopathy in our country. Many diagnostic methods such as FNAC, Culture, PCR and HP Examination of excised node have been advocated for confirmation of Tuberculous Lymphadenitis. However, FNAC is found to be the most cost-effective, simple, rapid, minimally invasive and conclusive tool in the diagnosis of Tuberculous Lymphadenitis.

Tuberculous lymphadenopathy can be seen in patients ranging from early to advanced age. In this study, the youngest patient was two-year-old and the oldest was 72 years' old. In a study by Ahmad et al,the youngest patient was two-year-old and the oldest being 95 years(6). Majority of the patients (80%) were in the second to fourth decades of life. Similar age distribution was seen in a study by Ergete and Bekele(20), Purohit et al(7) and Dandapat et al(8). A slight female predominance with 1:1.28 sex ratio was seen in our study. Similarly, female predominance was noted by Pamra et al(9) and Dandapat et al(8). while male predominance was noted by Rajsekaran et al(10), and Ahmad et al(6).

Clinically, in this study, cervical region was the most commonly affected region, involved in 86% of cases. This was in concordance with Bezabih et al(11) who observed cervical involvement in 74.2% of cases.

A study conducted by Sharma et al(12) in pediatric age group also showed similar results with female

predominance and most common involvement of cervical region (88.2%). The most common presentation amongst the Tuberculous lymphadenitis was matted lymph nodes (53%) which coincides with the study of Ahmad et al (6) accounting for 60% of cases with matted lymphadenpathy.

Similarly our findings of presence of Single lymph node

enlargement in 42% cases coincides with presence of single lymph node enlargement in 48.6% cases of tubercular lymphadenopathy by Aggarwal et al (13). We noted an incidence of 66% of tuberculous lymphadenopathy which is similar to the incidence of 69.5% of tuberculous lymphadenoathy found by Dagnachew Muluye et al (14).

Most common cytological pattern seen was necrosis only without granulomas(Fig. 3) in 41% of cases and polymorphs with necrosis(Fig. 4) in 30.3% of cases.While in a study by Gupta et al, epithelioid clusters

with or without Langhan's giant cells with necrosis was most commonly observed cytological pattern in 50.35% cases(15). This is also the classic pattern, commonly seen in excision specimens of tuberculous

lymphnodes. Highest AFB positivity(Fig. 5) was seen in smears revealing necrosis only without epithelioid

granulomas (89%) and polymorphs with necrosis with or without epithelioid granulomas (80%)

while the lowest 22% was seen in smears showing epithelioid granulomas without necrosis(Fig. 1).

Bezabih et al (11) found the highest AFB positivity in cases showing necrosis only without epithelioid granulomas (69.7%) and the lowest in cases showing epithelioid granulomas without necrosis (20.0%).

Similarly, the highest AFB positivity (75.6%) was seen in smears revealing necrosis only without epithelioid granulomas by Gupta et al(15).

In our study, overall AFB positivity (Fig. 5) was seen in 74% of cases. AFB positivity was observed in 71.7% of cases by Ergete and Bekele(20),59.4% cases by Bezabih et al(11),45.6% cases by Dasgupta et al(16) and 19.6% cases by Aggarwal et al(13). High AFB positivity noted in our study may be because of extensive screening done as in addition to one Z-N stained smear in each case, we got Z-N staining done on second smear or decolourized smear where cytology suggested tuberculosis, especially when necrosis was present.Yield of AFB positivity can further be increased by doing repeat FNAC of lymphnode(17). AFB negative cases revealing only epithelioid cell granulomas without necrosis should be clinically correlated with microbiological assessment.

Similarly, atypical cells should be ruled out in smears showing necrosis only without epithelioid cell granulomas and AFB negativity and material should be submitted for culture.Microbiological assessment is necessary in AFB negative cases to confirm the diagnosis of tuberculosis as approximately 10,000- 100,000

mycobacterial organism/ml of sample should be present for smear AFB positivity.

CONCLUSION

FNAC is a reliable, quick and economical investigating modality in tubercular lymphadenopathy. Despite certain limitations and pitfalls, it provides a high degree of accuracy in diagnosing tuberculosis. Diagnostic accuracy as high as 100% in tuberculous lymphadenopathy cases has been reported by Tripathy et al(18), 84.4% by Dasgupta et al(16), 83.3% by Dandapat et al(8) and 87% by Narang et al(19). Prompt diagnosis is helpful in reducing morbidity and mortality of tuberculosis. The demonstration of AFB in the FNAC smear is a gold standard for diagnosing tuberculosis. This can be easily done by Z.N. Staining. Wherever facilities of AFB culture are available, they may be used for detection of AFB. The FNAC smears of tuberculous lymphadenitis showed AFB positivity on Z.N. staining in 74% cases. We feel that in a developing country with high prevalence rate of tuberculosis, FNAC coupled with Z.N. staining should be the 1st line investigation in cases with lymphadenopathy. After cytopathological diagnosis, decision regarding AFB culture, biopsy or other relevant investigations can be taken up case to case if necessary.

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