

Short communication

Analysis of smear patterns in tubercular lymphadenitis by fine needle aspiration cytology in a tertiary care hospitalAmina Mukhtar¹, Cryslle Saldanha²²Department of Pathology, ¹Father Muller Medical College, Mangalore, 575002, Karnataka, India

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ABSTRACT

Introduction and Aim: India accounts for the highest number of extrapulmonary tuberculosis (EPTB), frequently manifested as lymphadenitis. Our study is designed to evaluate cytological patterns of tubercular lymphadenitis in FNAC, a rapid diagnostic procedure among patients in a tertiary care hospital presenting with lymphadenopathy.

Materials and Methods: A total of 193 patients were detected with tubercular lymphadenitis in a 3-year cross-sectional study. Chi-square test was done to analyze the patterns of tubercular lymphadenitis in FNAC and its association with Acid fast bacilli staining.

Results: The highest frequency of tubercular lymphadenitis was observed in cervical lymph nodes 125/193 cases (64.77%). Pattern B (epithelioid granuloma with necrosis) 94 cases (48.7%) constituted the predominant pattern. AFB positive smears were graded as follows, grade 1+: 28.6%, grade 2+: 47.6%, grade 3+: 23.8%. Grade 3 AFB positivity was observed among HIV (four cases) positive patients.

Conclusion: FNAC is a minimally invasive procedure in patients with Tuberculous Lymphadenitis, an extra pulmonary manifestation of Mycobacterial tuberculosis.

Keywords: Cytology; tuberculosis; HIV; ZN staining.

INTRODUCTION

Lymphadenitis is one of the frequent manifestations of extra pulmonary tuberculosis in India (1-4). Even though numerous laboratory parameters in conjunction with clinical features can suggest the diagnosis, these features are nonspecific and can be seen in other conditions, hence its essential to determine cytomorphological features before initiating antituberculosis treatment. In India with availability of finite resources, FNAC has an excellent sensitivity and specificity, avoids surgical operation and hospitalization in detecting tuberculous infection amongst the varied modes of detecting the disease (5-8). Co-infection with HIV increases prevalence of pulmonary and extra pulmonary TB (9). The objectives of our study were to determine the cytological patterns of tuberculous lymphadenitis in FNAC including HIV/AIDS detected cases and to determine its association the Acid-Fast Bacilli (AFB) staining.

MATERIALS AND METHODS

A retrospective cross-sectional and descriptive study was conducted over three-years duration in a tertiary care Hospital, Mangalore. Cytologically proven tuberculous lymphadenitis cases were reviewed from the cytology files. Patients' demographic details, clinical presentations, gross appearance of the aspirates obtained following FNAC were retrieved

from electronic medical records. The study was conducted after Institutional board review and approval from ethical committee.

Cytological evaluation

The smears with cytological features of tuberculous lymphadenitis stained with (May Grunwald's Giemsa) and Pap (Papanicolaou) stains were subdivided into three cytomorphological patterns according to Das *et al.*, (10,11) granulomas without necrosis [pattern A], granulomas with necrosis [pattern B], and necrosis with neutrophilic infiltrate and absence of granuloma [pattern C].

Smears detected to be AFB positive by Ziehl-Neelsen (ZN) staining were graded (12) as 1+: Occasional Bacilli seen, 2+: Singly scattered AFB, 3+ large numbers of Bacilli in bundles observed under $\times 10$. Enzyme linked immunosorbent assay was used to detect HIV.

Data analysis

Chi-square test was done to observe the patterns of tubercular lymphadenitis in FNAC and its association with Acid fast bacilli staining. $P \leq 0.05$ was considered to be significant.

RESULTS

One hundred and ninety three patients were diagnosed as tubercular lymphadenitis over a 3-year period. The age group commonly affected was 21-

40years (Fig 1) with a female predominance. The highest frequency of tubercular lymphadenitis was

observed in cervical group of lymph nodes 125/193 cases (64.77%; Fig. 2).

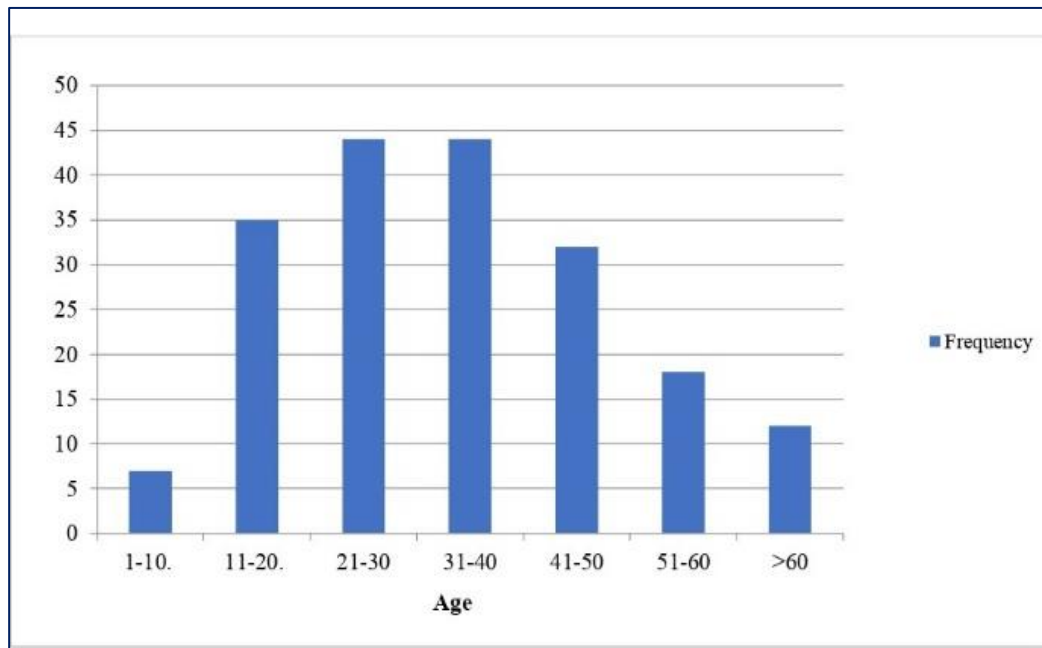


Fig. 1: Age-wise distribution of tubercular lymphadenitis

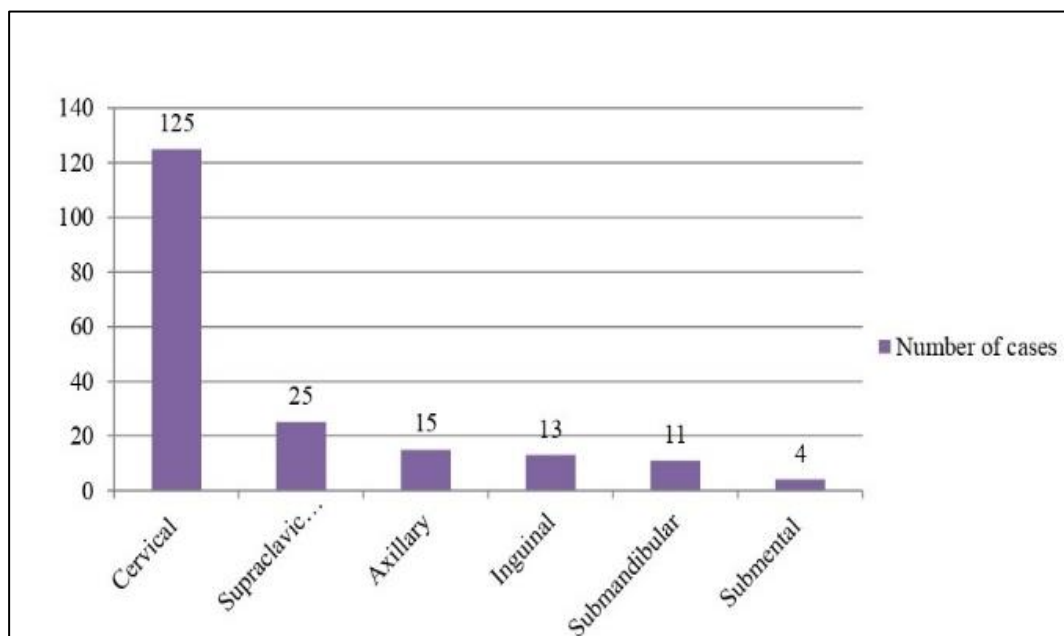


Fig. 2: Various anatomical sites involved in tubercular lymphadenitis

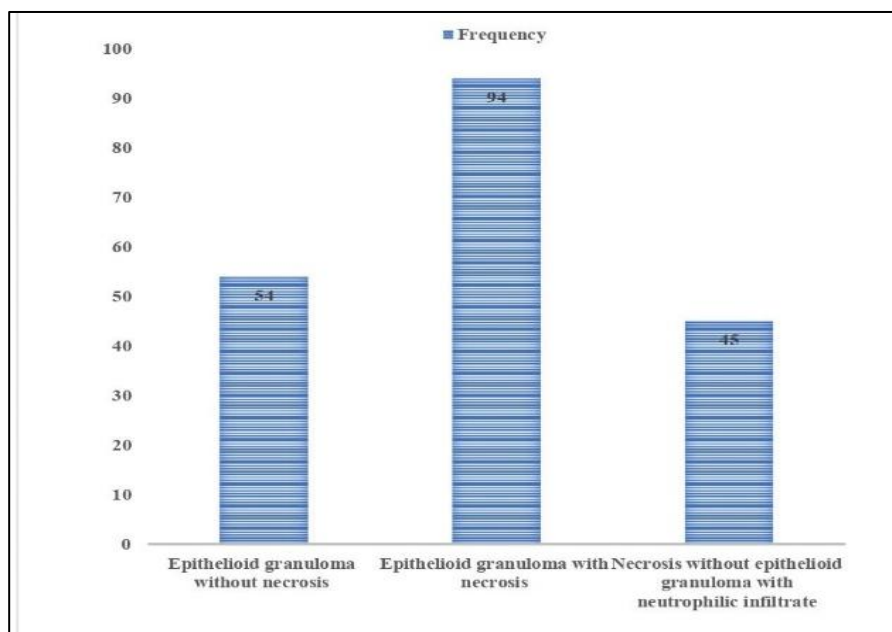


Fig. 3: Distribution of cases according to cytomorphology

Following fine needle aspiration cytology (FNAC), hemorrhagic aspirate was seen in 60 cases (36.59%), purulent or pus like material accounted for 55 cases (33.53%) and among 49 cases (29.87%) caseous necrotic aspirate was observed. All smears were categorized cytomorphologically into three patterns (Fig. 3).

1. Granulomas with absence of necrosis [pattern A] (Fig. 4a).
2. Granulomas associated with necrosis [pattern B] (Fig. 4 b).
3. Necrosis associated with neutrophilic infiltrate with absence of granulomas [pattern C] (Fig. 4c).

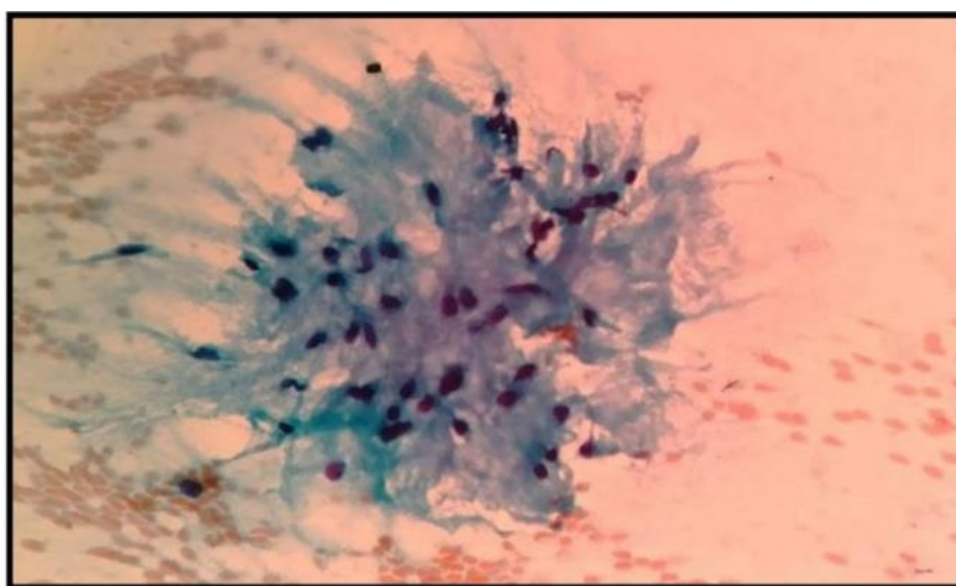


Fig 4a: Microphotograph showing a granuloma composed of epithelioid cells and lymphocytes. Necrosis is absent [Pattern A] (Papanicolaou stain-40x)

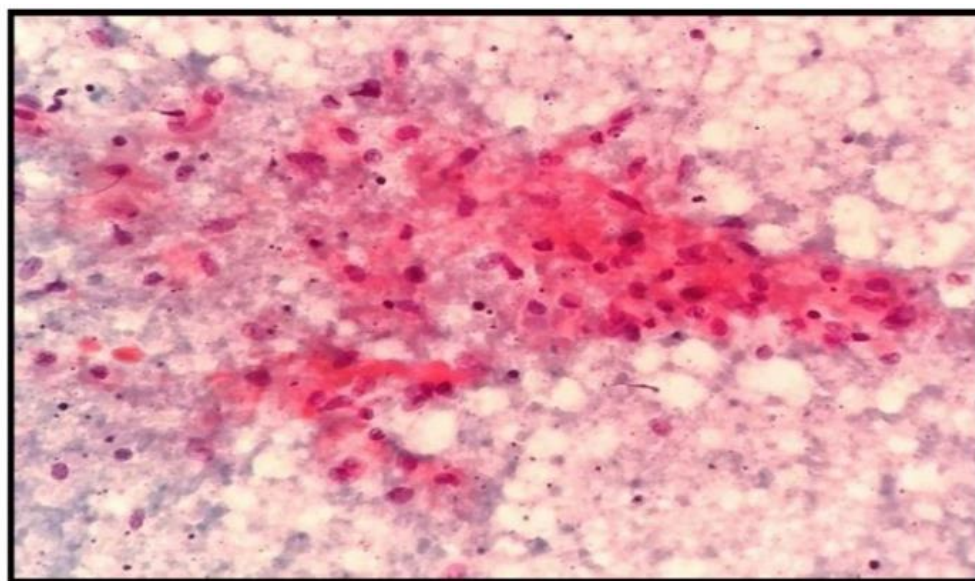


Fig. 4b: Microphotograph showing Granuloma in association with Necrosis [Pattern B] (Papanicolaou stain-40x)

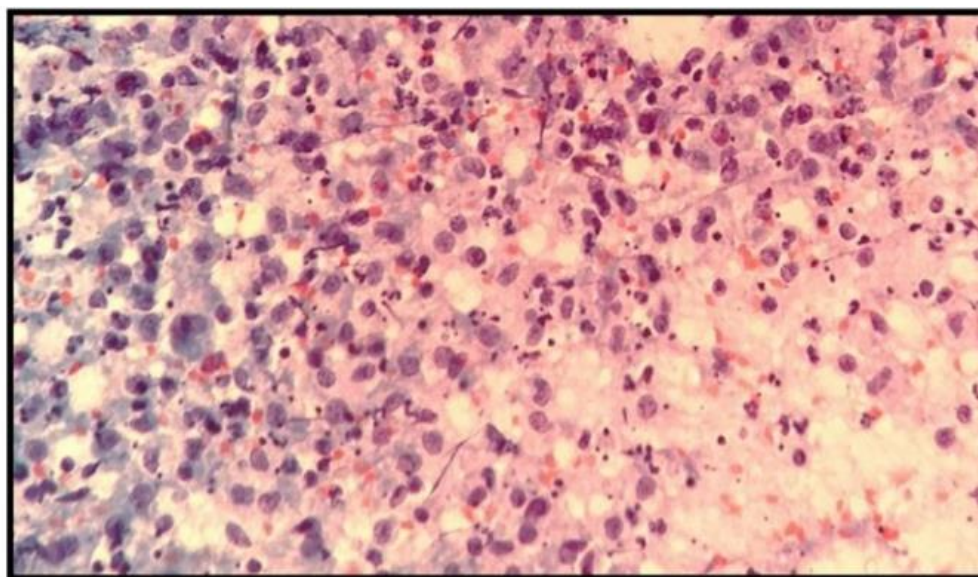


Fig. 4c: Microphotograph showing dense neutrophilic infiltrate and necrotic debris. [Pattern C] (Papanicolaou stain-40 x)

Among 193 patients diagnosed as tubercular lymphadenitis, pattern B was predominant in 94 cases (48.7%) of which 54 (68.7%) were AFB positive while 40 (35.1%) were AFB negative. 54 cases (28%) belonged to Pattern A where a majority of 48 (42%) were found AFB negative and only 6 (7%) were AFB positive. 45 (23.3%) resembled the descriptions of pattern C where 19 (24.1%) were AFB positive and 26 (22%) AFB negative.

Following staining by ZN method, positive smears were graded as follows: grade 1 +: 28.6%, grade 2+: 47.6 grade 3+: 23.8 %. In our study, 4(2.1%) cases with HIV positive showed only dense neutrophilic infiltrate and necrotic debris without granulomas and were grade 3 +. P value of <0.001 was seen between

the cytomorphological patterns observed and AFB positivity which was statistically significant.

DISCUSSION

Tuberculosis, continues to pose a great challenge in health care system especially in India. Extra pulmonary form with involvement of lymph nodes is commonly observed (13). FNAC, often reduces the need for surgical biopsy (14). In our study, 193 patients diagnosed with tubercular lymphadenitis, age group commonly affected were 21-40 years. Gupta *et al.*, (15) reported similar age distribution as observed in our study. Lymphadenitis was predominant in females (53.9%), as compared to males (46.1%). A similar trend was noticed in the studies of Gupta *et*

al., and Fatima *et al.*, (15,16). Substandard nutritional status and overall lower standards of life in developing countries maybe associated with higher incidence in females (15). The lymph nodes involved were cervical (64.77%), and supraclavicular (12.95%). Rana *et al.*, (17) and Masilamani *et al.*, (8) reported similar results in their study. In most instances, portal of entry to the cervical lymph nodes by the microorganism is via tonsils.

Following FNAC, appearance of aspirate was hemorrhagic in 36.5%, purulent in 33.5% and caseous in 29.9%, which was in concordance with the study done by Masilamani *et al.*, (8). In FNAC smears, maximum number of cases were pattern B (48.7%) as observed in a study by Masilamani *et al.*, (8) and Gupta *et al.*, (5), followed by pattern A (28%) and pattern C (23.3%). Following ZN staining, Pattern B (68.4%) showed highest AFB positivity, like Gupta *et al.*, (15), whereas Masilamani *et al.*, (8) found highest AFB positivity in pattern C. Lymphocytes, epithelioid cells and multinucleated giant cells prevent the spread of infection by limiting the proliferation of tubercle bacilli. However, proliferation of tubercle bacilli is observed in association with necrosis (17). The HIV positive four cases were grade 3+ AFB positive and resembled pattern C, which is in concordance with Masilamani *et al.*, (8). According to Rajasekaran *et al.*, depletion of CD4+ cells in AIDS patients results in absence of typical epithelioid granuloma (18).

CONCLUSION

Cytological examination plays a vital role in diagnosis of tuberculous lymphadenitis. Diagnostic accuracy of FNAC is critical in helping a clinician to significantly reduce the mortality and morbidity of the patient

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CONFLICT OF INTEREST

Authors declare no conflict of interest.

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