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Cytological patterns of tubercular lymphadenitis and its histopathological correlation in a tertiary care centre in South India-A revisited study

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ABSTRACT

Background: Tuberculous lymphadenitis is the most common cause of lymphadenopathy in India. Despite, availability of many literature on Daignosis and management of Tuberculosis in various parts of India, practically diagnosis of Tuberculosis sometimes pose a challenge to the pathologists and clinicians. A holistic diagnostic approach of cytology with aid of special stain and histopathological evaluation resolves this diagnostic dilemma.

Aim: The present study was carried out to evaluate the different cytological patterns of tuberculous lymphadenitis in our settings along with utility of special stain like Acid fast stain and further histopathological evaluation

Material and Methods: Five hundred and three cases of superficial lymphadenopathy were subjected to Fine Needle Aspiration Cytology (FNAC), and smears were prepared and stained with Hematoxylin and eosin (H and E), Giemsa, Papanicalou and Acid Fast stain and were categorized into three cytomorphological patterns. If the swelling underwent excision biopsy, they were correlated with histopathological examination also.

Result: Out of 503 cases of lymph node swelling aspirated, 200 cases (39.7%), showed features of Tuberculous lymphadenitis. Majority of cases (72.2%) were in their second to fourth decades of life, with male-to-female ratio of 1:2. Cervical region was the most common site of involvement. Smears revealed epithelioid granulomas with caseous necrosis in maximum cases (55%).AFB positivity was seen highest in smears revealing necrosis only with or without epithelioid cell granulomas (76.3%).

Conclusion: FNAC has been proved very safe, highly sensitive, and first line investigation in diagnosing tubercular lymphadenitis. Hence, the approach to tubercular lymphadenitis attains completeness with cytopathological and histopathological evaluation.

1. Introduction

Lymphadenopathy is one of the common conditions, out of which nonneoplastic causes are most commonly encountered in clinical practice and amongst them too, tubercular lymphadenopathy is the most common of all.[1] Lymphadenopathy is frequently due to a local or systemic, benign, self-limited, infectious disease. Even, a malignancy can present with a palpable lymph node. The cause of lymphadenopathy is based on the location-viruses, bacteria and Mycobacterium causes cervical lymphadenopathy, supraclavicular lymphadenoapthy is caused by Mycobacterium, metastasis, axillary lymphadenopathy by Staphylococcus, streptococcus, Cat scratch disease etc. and inguinal lymphadenopathy is caused due to sexually transmitted diseases. Fine needle aspiration cytology (FNAC)aids as one of the diagnostic tool for the clinician to establish the cause and manage it. Special stains like acid fast stain etc helps further to confirm the cause of lymphadenopathy, by demonstration of tubercle bacilli.[2] For further confirmation, excision biopsy is also warranted. Hence, evaluation of lymphadenopathy is a complete approach, which includes clinical history, radiological examination, FNAC and histopathological examination.

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2. Materials and Methods

The present study was carried out in the department of pathology, Mahatma Gandhi Medical College and Research Institute, Pondicherry for a period of one year. The patients who presented with lymph node swelling were identified, correlated with clinical and radiological findings on the request forms. The swelling was fixed and under aspetic and safety precautions, fine needle aspiration technique suing negative section was applied.22 to 23 gauze needle with 10 ml disposable syringes were used. Minimum of three stains- H&E stain, MGG stain and Pap stain were done. In addition, stain for AFB was done. The cytological diagnoses were correlated whenever possible with histopathological examination. The data were entered in MS Excel sheet and analyzed.

3. Results

Cytological diagnosis of tubercular lymphadenitis was made in 200 cases, out of 503 cases, that presented with lympadenopathy.

The age group of patients diagnosed cytologically as tubercular lymphadenitis, ranged from 5 years to 80 years. Most of the cases (72.2%) were seen amongst 20-40 years of age group, with male-to-female ratio of 1:2.

The cervical region was the most common site of involvement (82%), followed by axillary (13%) and inguinal lymph node (5%).

The smears were divided into three groups:

A. Epithelioid cell granuloma with or without Langhan's giant cells with necrotic material.

B. Epithelioid cell granuloma with or without Langhan's giant cell, without necrosis.

C. Occasional epithelioid cell granuloma without typical necrosis.

The group-A consisted of 110(55%) patients, group-B consisted of 53(26.5%) patients and Group-C consisted of 37(18.5%) patients.

AFB staining was done in all the cases. Group-A revealed AFB positivity in 84(76.3%) cases, group-B releaved AFB positivity in 22(41.5%) cases. Group-C releaved AFB positively in 10 (27"%)cases.

Biopsy correlation was possible in only 92 cases, 22(23.9%) of group-A, 64(69.5%) of the group-B, 6 (6.52%) of the group-C Amoung group-A and B, all biopsies diagnosed as tubercular lymphadenitis on histopathological examination. In group-C, 3(3.26%) cases were diagnosed as reactive lymphadenitis and the remaining 3(3.26%) cases as tubercular lymphadenitis, making the false positive rate of 3.26%.

4. Discussion

FNAC is a simple, non invasive, cheap procedure with high sensitivity in diagnosing tuberculosis in developing countries such as India. Tubercular lymphadenitis can be seen in patients ranging from early to advanced age.[3]

Tubercular lymphadenitis constituted commonest group of lymphadenipathies diagnosed by fine needle aspiration, numbering 200 patients (39.7%) out of 503 patients of lymphadenopathy. The results of our study were in accordance with studies conducted by Mitra SK et al, Paliwal Nidhi et al and Hemalatha et al.

In our study, the youngest patient was 5 years old and the oldest was 69 years old. Majority of cases (72.2%) were 20-40 years old with male-to-female ratio of 1:2. Similar pattern of age distribution was seen in studies conducted by Mitra SK et al, Paliwal Nidhi et al and Hemalatha et al.[4–6] High incidence in females may be due to poor nutritional status and overall lower standard of living in developing countries.[7]

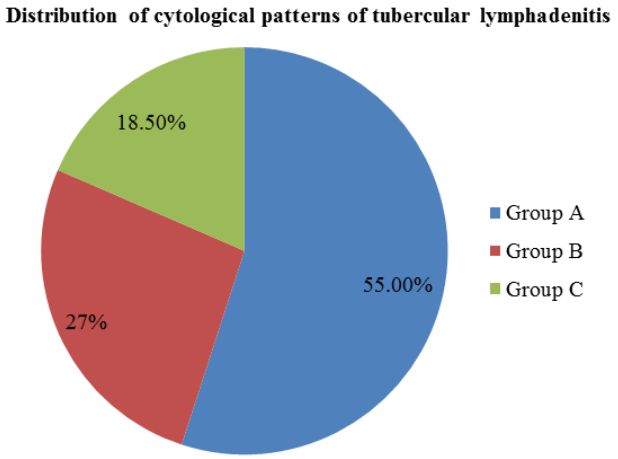

Fig. 1: Percentage distribution of cytological patterns of tubercular lymphadenitis

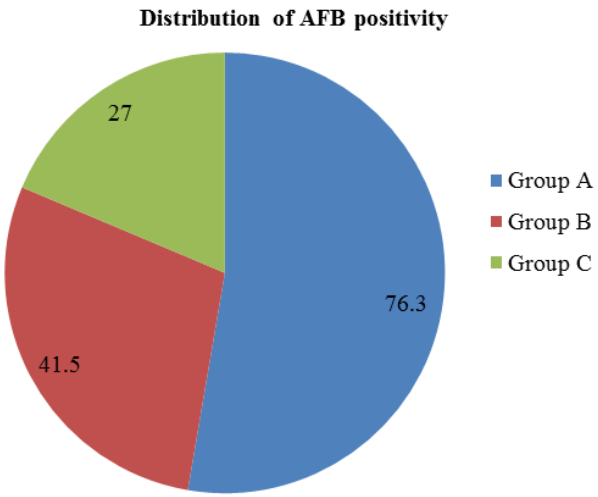

Fig. 2: Percentage distribution of AFB positivity

Table 1: Cyto-histopathological correlation of Tubercular lymphadenitis(92 cases)

No	No. of case in which biopsy done	Tubercular lymphadenitis	Reactive lymphadenopathy
A	22	22	0
B	64	64	0
C	6	3	3

Table 2: Summary of Statistical value

FNAC	**Histopathology**	
	Tubercular	Reactive lymphadenitis
Tubercular Lymphadenitis(92)	89(TP)	0(FN)
Reactive Lymphadenitis(3)	0(TN)	3(FP)

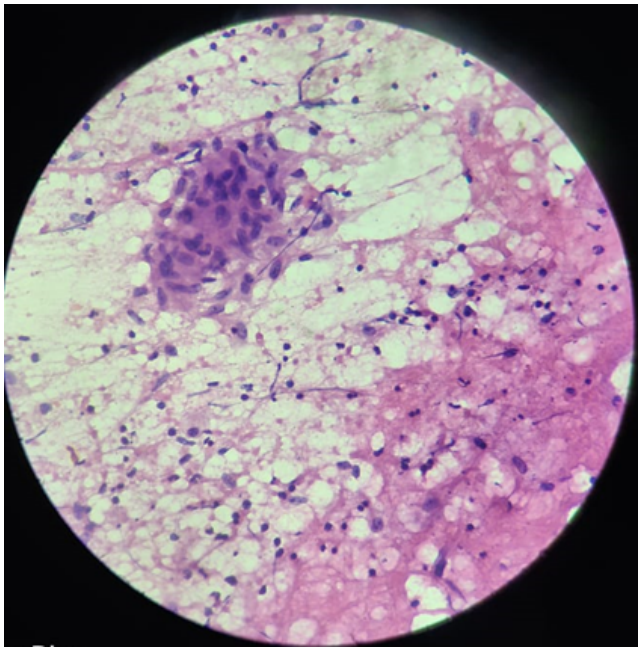

Fig. 3: Cytology smear showing caseating granuloma

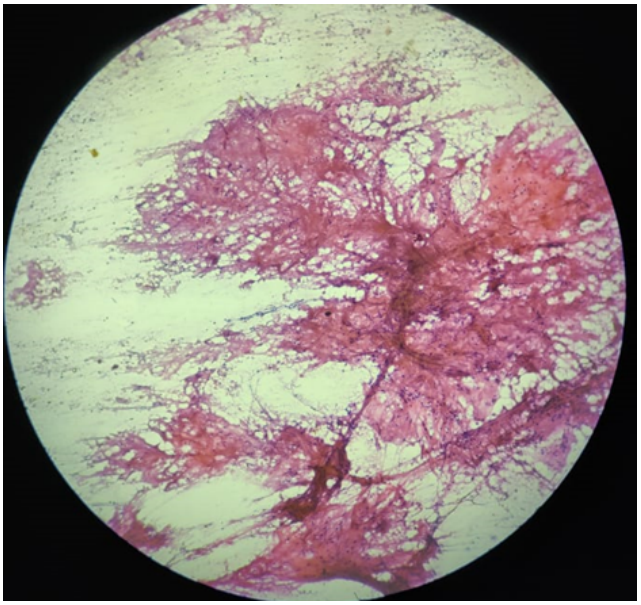

Fig. 4: Cytology smear showing caseating granuloma

In our study, cervical region was the most commonly affected region involved in 82% of the cases. This is in concordance with Mitra SK et al and Paliwal Nidhi et al.[4,5]

Most common cytological pattern in our study was epithelioid granulomas with caseous necrosis in 55% cases. Other studies like Paliwal Nidhi et al, Mitra SK et al and Hemalatha et al also reported epithelioid granulomas with caseous necrosis as the most common cytomorphological pattern.[4–6] This is because TNF- alpha and IFN- gamma are secreted by the macrophages causing the formation of the caseating granuloma, whereas IL-10 is one of the main negative regulators of the response.[6]

Stain for AFB showed maximum positivity amongst smears showing necrosis only with or without epithelioid cell granulomas (76.3%). Our study is correlating with the study of Mitra SK et al, Paliwal Nidhi et al and Hemalatha et al.[4–6]

The immune response to mycobacterium TB is mainly due to delayed Type IV hypersensitivity. It is marked by the activation of Th1 cells, cytokines (γ interferon) and tumor necrosis factor – a secreted by the activated macrophages.[7] These macrophages at the center form a granuloma and try to phagocytose the bacilli. But the bacilli fail to get destroyed and caseous necrotic material is formed in the central part and leading to tissue destruction occurs. The central necrosis starts liquefying and this contains abundant bacilli. Thus, granulomatous reaction with little or no necrosis would be associated with few bacilli. In immunocompromised conditions, necrosis will be more with lack of granulomatous reaction, thereby acid fast stain shows more bacilli.[8] The above data strongly coincides with our study.

Histopathological correlation was possible in only 22(41.5%) of group-A, 64(58.1%) of the group-B, 6 (16.2%) of the group-C Amoung group-A and B, all biopsies were diagnosed as tubercular lymphadenitis.

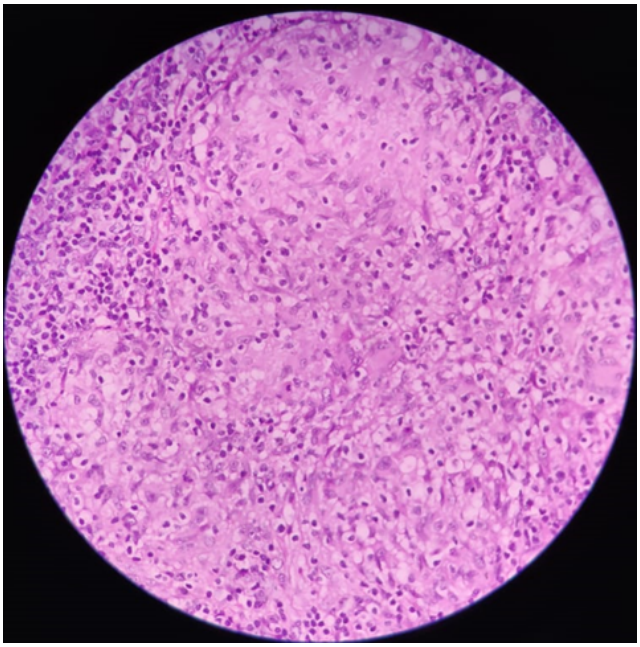

Fig. 5: Caseating tubercular granuloma on H and E

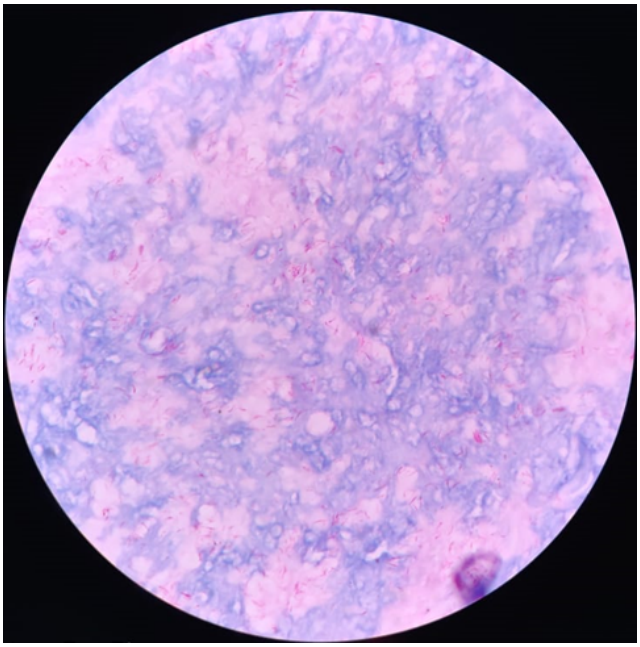

Fig. 6: AFS smear positive for tubercle bacilli

In group-C, 3(50%) cases were diagnosed as reactive lymphadenopathy and the remaining 3 (50%)cases as tubercular lymphadenitis. Our study was in concordance with Narayanamurthy C et al. Whereas, studies like Mitra SK et al, Paliwal Nidhi et al and Hemalatha et al. did not have histopathological correlation.[4–6]

There were hardships in arriving at a definitive diagnosis in certain cases of tubercular lymphadenitis, when the aspirate showed a polymorphous picture with few epithelioid cells and absence of typical Langhan's giant cells or caseous necrosis, making it necessary to go for an excisional biopsy for definitive diagnosis.

5. Conclusion

FNAC has been proved as an useful, safe, not very expensive, highly sensitive investigation in diagnosing Tubercular lymphadenitis.[9] The sensitivity can be further be increased by complementary cytomorphology with acid fast staining.[10]Diagnostic accuracy can be further increased by histopathological correlation. In conclusion, findings from the present study emphasize a definite need for a combination of tests for diagnosing Tubercular lymphadenitis.[11]

6. Source of Funding

None.

7. Conflict of Interest

None.

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