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Cytomorphological characteristics of Tuberculous Lymphadenitis.

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Abstract
Background: *Tuberculosis (TB) is an infectious disease which typically affects the lungs (pulmonary TB) but can also affect extrapulmonary sites such as cervical lymph nodes.*
Objectives: *It is a cross-sectional observational study done with the objective to evaluate the cytomorphologic features in cases of tuberculous lymphadenitis which showed positivity for acid fast bacilli. Frequency in relation to age, sex, and caste and site predilection was estimated.*
Material and methods*: Clinical features of all patients suspected of cervical TB presenting for Fine needle aspiration cytology (FNAC) were recorded. FNAC was done with 23 gauge needle. Appearance of aspirate was noted. Smears were stained by Haematoxylin Eosin (H&E) for morphology and Zeihl-Neelsen (ZN) stain for Acid Fast Bacilli. Detailed cytomorphologic characteristics were recorded.*
Results*: Samples from 494 suspected cases of cervical tuberculous lymphadenitis over the period of thirty three months were collected . Out of which 62 cases (12.5%) were positive for Acid Fast Bacilli (AFB) on Zeihl-Neelsen staining. Among these 28 were males and 34 females. Majority were in the age group 20-40 years. Right cervical group of lymph nodes was commonly involved. Fine needle aspiration cytology showed necrosis as the predominant feature in AFB positive cases.*
Conclusion*: Cervical tuberculous lymphadenitis is more common in women and predominantly involves right cervical group of lymph nodes. Majority of AFB positive smears demonstrate necrosis as principal cytomorphologic feature. ZN staining of necrotic or suppurative FNA smears for AFB is cheap, rapid and effective diagnostic tool for primary extra-pulmonary nodal Mycobacterial detection.*
Key word: *Extrapulmonary Tuberculosis, Tuberculous lymphadenitis*

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I. Introduction

Scrofula or Tuberculous lymphadenitis (TLA) is the distinctive manifestation of mycobacterium. Epidemiological characteristics are different from those of pulmonary tuberculosis (TB). Diagnosis is also challenging unless Acid Fast Bacilli (AFB) are demonstrated by Zeihl-Neelsen (ZN) staining of direct smears or culture. Fine needle aspiration cytology (FNAC) has emerged as primary diagnostic technique especially in developing countries like India where TB is rampant. In most of the FNA studies from TB endemic countries, diagnosis is based on detection of granulomatous inflammation with or without caseation necrosis. Conditions such as Toxoplasma, fungal infections, cat scratch disease, and sarcoidosis also lead to granulomatous lymphadenitis[1]. Even in the absence of epithelioid cell granulomas if necrosis is present diagnosis is possible[2]. Tuberculous lymphadenitis occurring in the cervical region is the most common cause of extra-pulmonary tuberculosis (TB)[3]. In this study the epidemiological characteristics and cytomorphologic features of AFB positive cervical lymphadenitis are evaluated.

II. Material And Methods

All the cases of cervical lymphadenopathy attending the Pathology Department in a rural medical college hospital in West Bengal for FNAC over the period of thirty three months were included. Samples were collected from 494 cases of suspected cervical tuberculous lymphadenitis. Age, sex and caste were documented. Site of lymphadenopathy whether right or left cervical chain or supraclavicular was noted. FNA was done with 23 gauge needle. Gross finding of the aspirate was recorded. All the smears were stained with Haematoxylin Eosin and ZN stain as per standard procedure.AFB in direct smears were defined as bright red long, slender finely beaded rods under oil immersion objective.

For the purpose of evaluation, FNAC slides and records of only AFB positive cases were reviewed. Cases were divided into three types based on cytomorphological features. Type 1 included smears showing

predominantly caseation necrosis (with or without epithelioid cell granulomas). Type 2 included smears showing predominantly suppuration (plenty of neutrophils obscuring other details) and Type 3 included epithelioid cell granulomas with or without necrosis.

III. Results

Out of 1395 patients presenting with cervical lymph-adenopathy, total 494 (35.41%) were diagnosed as TLA based on clinical and cytological features supplemented by ZN staining. Direct demonstration of AFB by ZN staining in smears was noted in 12.5 % (62 / 494) cases. These 62 cases which showed AFB positivity on ZN stain were selected for detailed cytomorphological evaluation. Among these 62 cases, 28 were males and 34 were females. Majority were in the age group 20-40 years (Table-1). 42 belonged to Hindu and 20 Muslim communities. Right cervical chain followed by bilateral and multiple lymph nodes were predominantly involved (Table-2). On gross appearance, aspirate was cheesy in 34, thick pus like in 16, Blood mixed in 9 and thin fluid like in 3 cases. Evaluation of FNAC showed majority belonged to Type-1 cytomorphologic picture (Table-3).

Table – 1: Distribution of AFB positive cases by age and sex group (n=62)

Age	Male	Female	Total
<20	10	13	23
20-40	15	17	32
41-60	3	4	7
>60	0	0	0
	28	34	62

Table – 2: Distribution of AFB positive cases according to site predilection (n=62)

Site	Number of cases
Right cervical group	27
Left cervical group	16
Bilateral and Multiple	19

Table – 3: Distribution of AFB positive cases according Cytological features (n=62)

Predominantly Caseation necrosis with occasional granulomas(Type-1)	34
Predominantly Suppuration (Type-2)	21
Predominantly granulomas without necrosis(Type-3)	7

IV. Discussion

India is the highest TB burden country accounting for one fourth of the global TB burden[4]. Lymphadenitis involving the cervical chain is the most common form of extra pulmonary tuberculosis[5]. FNAC as a diagnostic procedure is already established and it has been found to be as efficient as biopsy, particularly in cases of tubercular lymphadenitis[6]. Macroscopic and Microscopic features of aspirates in cases of TLA have been described in multiple studies[7,8]. According to Gomes et al[9] a sample is called diagnostic when Z-N stain and/or culture is positive, suggestive when there is granulomatous inflammation, and inconclusive when there is non- specific inflammation or isolated giant cell. There are a number of studies on correlation of cytomorphologic findings with AFB positivity in extrapulmonary tuberculosis. On cytomorphological correlation maximum positivity for AFB and culture was found in smears showing necrosis [10, 11, 12].

In the present study, causative organism was demonstrated by FNAC in 12.5 percent of suspected tuberculous lymphadenitis. Varying percentage of AFB positivity reaching up to 55% is shown in studies involving extrapulmonary tuberculosis[5].

Enlargement of right cervical group of lymph nodes was the most common presentation (total 27 cases including 5 cases of right supraclavicular lymph nodes). This was followed by bilateral and multiple group. Strangely not a single study on internet search in our knowledge reported right side predilection of cervical TB though multiple and bilateral involvement has been acknowledged[2]. Disease is highest among patients aged 20-40 years thus corroborating with some of previous studies. It was more common amongst women, a pattern different from pulmonary tuberculosis, which is more common in men[13].

When we evaluated the records regarding gross findings of aspirated material it was undoubtedly evident that in all 34 cases which belonged to Type-1 cytomorphology on smears (predominantly caseating necrosis with occasional epithelioid cell granulomas), aspirated material was cheesy in appearance. However, it was also observed; that sometimes AFB was not found in overt cheesy material. This may perhaps occur in the patients undergoing treatment.

Cytological evaluation revealed that most common cytological feature of AFB positive lymphadenitis was presence of caseous necrosis. A multivariate regression analysis in a study has revealed that necrosis was the only independent contributing factor towards AFB positivity[12].

V. Conclusion

Extra pulmonary cervical tuberculosis predominantly involves right cervical group of lymph node and majority occurs in women rather than men. Aspirate showing gross and microscopic picture of caseous necrosis is principal cytological feature where chance of AFB detection is high.

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