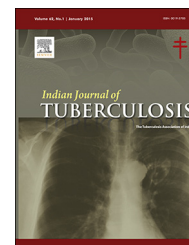


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Original Article

Diagnosis of clinically suspected and unsuspected tubercular lymphadenopathy by cytology, culture, and smear microscopy

Vivek Gupta^{a,*}, Arvind Bhake^b^a Assistant Professor, Department of Pathology, Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha 442002, India^b Professor and Head, Department of Pathology, Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha 442002, India

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ABSTRACT

Background: Tubercular lymphadenopathy (TBLN) accounts for 20–40% cases of extrapulmonary tuberculosis. But the common presenting symptoms of tuberculosis like fever, cough, weight loss, fatigue, and night sweats are not always associated with tuberculosis lymphadenopathy, thereby, making its diagnosis difficult. Our aim was to study if Fine Needle Aspiration Cytology (FNAC) combined with Zeihl Neelsen stain and culture for *Mycobacterium tuberculosis* bacilli could improve the diagnostic accuracy in patients clinically suspected and unsuspected for tubercular lymphadenitis.

Methods: The study was conducted at Department of Pathology, Acharya Vinoba Bhave Rural Hospital, Jawaharlal Nehru medical College, Wardha, India. One hundred and twenty-nine patients with enlarged lymph node for more than two weeks duration were evaluated. All the patients were subjected to cytology, smear, and culture examination of their lymph node aspirate.

Results: Age range for the patients was from 1 to 74 years (mean 30.49 ± 16.69) and F:M ratio was 1:1.18. Most common site of involvement was cervical lymph node. 48 patients were diagnosed as TBLN, out of which 19 patients had no associated symptoms and 28 patients had one or more presenting symptoms of tuberculosis. Fever was the most common presenting symptoms. Pediatric age group patients were more commonly associated with symptoms than adults (p value = 0.000). Culture and ZN stain were positive in 32 and 10 cases respectively among TBLN. Additionally, culture was positive in 20 patients diagnosed as reactive lymphoid hyperplasia.

Conclusion: Cytology combined with culture improves the diagnostic accuracy in cases with enlarged lymph nodes, suspected or unsuspected for tuberculosis.

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* Corresponding author. Tel.: +91 9420245648.

E-mail address: dr_vivek_gupta@yahoo.com (V. Gupta).<http://dx.doi.org/10.1016/j.ijtb.2016.11.014>

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1. Introduction

Tuberculosis (TB) is one of the greatest killers worldwide and continues to threaten the human race since time immemorial, not only due to its effects as a medical problem, but also by its impact as a social and economic tragedy. TB accounted for 9.6 million new cases and 1.5 million deaths in 2014. It is among the top 5 causes of death among women aged 15–44 years. Over 95% of TB deaths occur in low- and middle-income countries. In 2014, India is among the top six countries having largest number of incident cases of Tuberculosis.¹

TB can occur as pulmonary tuberculosis or extrapulmonary tuberculosis (EPTB). EPTB tuberculosis accounts for one-fifth of all the cases of tuberculosis² and can involve lymph nodes, pleurae, meninges, pericardium, skeleton, gastrointestinal tract, genitourinary tract, and can even be miliary TB. Tubercular lymphadenopathy (TBLN) accounts for 20–40% cases of EPTB.³ The common presenting symptoms of TB like fever, cough, weight loss, fatigue, and night sweats are not always associated with TBLN. Patients may often present with only enlarged lymph node. They are investigated by Fine Needle Aspiration Cytology (FNAC) or biopsy for histopathology to find out the cause of lymphadenopathy. In these cases, conventional, diagnostic methods like Ziehl Neelsen (ZN) staining and culture for lymph node aspirates or biopsy can help to provide the evidence of tuberculosis by detecting *Mycobacterium tuberculosis bacilli*.^{4,5} But a diagnostic difficulty is met when there is absence of associated symptoms or when the FNAC results are not suggestive of TBLN.

With this background, we aimed to study if FNAC combined with tubercular bacilli detection techniques (ZN stain and culture) could improve the diagnostic accuracy in patients clinically suspected and unsuspected for tubercular lymphadenitis.

2. Materials and methods

2.1. Study site and design

This cross-sectional study was conducted at Acharya Vinoba Bhave Rural Hospital attached to Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Science (Deemed University), Sawangi, Wardha, during the period from September 2015 to June 2016.

2.2. Study participants

Patients with enlarged lymph nodes of more than two weeks duration clinically suspected and unsuspected for tubercular lymphadenopathies were included.

2.3. Fine needle aspirates and culture

FNAC was done with 23 gauze needle, under aseptic condition and material was aspirated using 20 ml disposable syringe attached to Franzen handle. The aspirate obtained was divided into two parts: one taken for cytological examination where smears were prepared, two air dried and one wet fixed in each

cases; the second part was treated with N-acetyl-L-cysteine and sodium hydroxide (NALC/NaOH) for decontamination and taken for culture by inoculating on Lowenstein-Jensen (LJ) slants.⁶

The cytological criteria (for FNAC) for diagnosis of possible TBLN were presence of epithelioid cell granulomas with or without multinucleated giant cells and caseation necrosis.^{7,8} Culture was observed for eight weeks after inoculation for each case.

2.4. Ethical considerations

Ethical clearance was obtained from the institutional ethics committee. Informed consent was taken from all patients and those unwilling to participate in study were excluded.

2.5. Statistical analysis

Data entry and analysis was done using SPSS 11.5 for Windows. Analysis using cross-tabulation was performed to assess relationships among variables. The Pearson Chi square test was used to compare differences in the presence of symptoms in different age groups. Differences were considered statistically significant if $p \leq 0.05$.

3. Role of funding source

The research work was funded by International Society of Infectious Diseases, USA. The funder has no role in study design, data collection, data analysis, data interpretation or writing of report.

4. Results

A total of 129 cases were included in this study with age range from 1 year to 74 years (mean 30.49 ± 16.69). The female to male ratio was 1:1.18. Cervical lymph node was the most commonly involved lymph node. A total of 23 cases were in pediatrics age group (≤ 14 years) and 107 patients were in adult age group (>14 years). On cytopathology, 48 patients were diagnosed with TBLN, 63 patients with reactive lymphoid hyperplasia, 1 patient with suppurative lymphadenitis, and 17 cases with malignancy.

Out of 48 cases diagnosed as TBLN, history of exposure through family members was present in three patients and 3/48 patients had previous partial or full treatment of tuberculosis. Fever was the most common presenting symptom involving 19 (39.3%) patients, followed by weight loss in 6 (12.5%) patients, and cough or loss of appetite in 3 (6.3%) patients. Six (12.5%) patients had more than two symptoms and 4 (8%) patients had more than three symptoms whereas 19 (40%) patients had no symptom suggestive of tuberculosis (Fig. 1).

Out of the 23 pediatric patients, cytological diagnosis of tubercular lymphadenitis was made in 5 (22%) patients and none had exposure to or previous history of tuberculosis. Fever was present in 3 (13%) patients and one patient had cough. The remaining 19 did not have any symptoms.

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