

Utility of Fine Needle Aspiration Cytology in Tuberculous Lymphadenitis

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ABSTRACT

With tuberculosis being rampant in India, the need to diagnose and manage these patients in a cost effective, timely and efficient way is large. Lymphadenitis being a common presentation of tuberculosis, requires proper evaluation. Tuberculosis remains a common health problem in developing countries like India. With roots in poverty, malnutrition and overcrowding, multi drug resistance and HIV infection has added to the problem. Lymphadenitis which is a common presentation of tuberculosis is easily assessable for evaluation by fine needle aspiration. Utility of recognition of various cytomorphological features of tuberculous lymphadenitis is well established. Correlating it with AFB positivity could be of use in managing these patients. A prospective study was carried out, wherein all suspected patients of tuberculosis presenting with superficial lymphadenitis were subjected to fine needle aspiration. Material obtained was submitted for cytomorphological examination and AFB staining by Ziehl Neelsen method. Good correlation was obtained in cases of tuberculous lymphadenitis with AFB staining. Cytopathological examination is useful in diagnosing cases of tuberculosis. AFB staining on aspirates, adds to the diagnosis.

KEY WORDS: CYTOPATHOLOGY, TUBERCULOSIS, FNAC, LYMPHADENITIS.

INTRODUCTION

Tuberculosis, an unabating illness affecting mankind since ages, is a cause of much of suffering in terms of loss of health, pecuniary and psychological resilience. Previously known as disease of poor, it has now crossed all socioeconomic barriers to affect even the affluent. According to global tuberculosis report by WHO in

2019, India ranked first in estimated annual incidence of tuberculosis and shares 27% of global burden of the disease. India reported a total of 26,90,000 new cases in 2018, with 92,000 being in HIV positive patients. Mortality in HIV negative patients was 4,40,000 and mortality in patients with HIV coinfection was 9,700. India also leads in reporting of drug resistant TB cases. Globally, half a million new cases of drug resistant TB were reported in 2018, with 12% being rifampicin resistant and 78% being multidrug resistant. Out of these, India accounted for 27% of cases. Even when the notification rate from India has increased since 2013, it accounts for highest notification gap (25%) worldwide. However, India has shown improvement in terms of treatment outcome, contributing substantially to the global treatment success rate in new cases which rose

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to 85% in 2017 from 81% in 2016. With such a high disease burden, it has become a common practice to start empiric treatment for patients presenting with suspicious symptoms, supported by various diagnostic tests such as CXR, ESR, Montoux, IGRA and where possible FNACs and biopsies. Definite diagnosis of TB by establishing causal relation based of smears, culture or molecular testing is not done in all cases, leading to empiric drug abuse and in turn aggravating the problem in toto by increasing drug resistant cases.

Aim And Objectives

Aim: To determine utility of fine needle aspiration cytology in management of Tuberculosis.

Objectives of study: To conduct a prospective study in suspected cases of tuberculosis presenting with superficial lymphadenitis.

1. To evaluate and classify cytomorphologically all suspected patients of tuberculosis presenting with superficial lymphadenitis.
2. To evaluate and classify various patterns seen in tuberculous lymphadenitis on cytology.
3. To correlate the cytomorphological pattern with AFB staining on aspirated material.

MATERIAL AND METHODS

Research Design and Methodology: A prospective study was carried out at Datta Meghe Medical College and Shalini Tai Meghe Hospital and research centre in association with Acharya Vinoba Bhave Rural Hospital and Jawaharlal Nehru Medical College for a duration of 8 months in which all suspected patients of tuberculosis presenting with superficial lymphadenitis were evaluated with respect to cytomorphology, AFB staining and bacteriological index on aspirated material.

Inclusion criteria: All suspected patients of tuberculosis presenting with superficial lymphadenitis.

Exclusion criteria: All patients who have received previous anti tubercular treatment.

Sample Collection Process

FNAC was done using 5 ml syringe under all aseptic precautions. Material thus obtained was subjected to papanicolaou, giemsa, H&E stain and ZN stain. Slides were evaluated and tubercular lesions classified into four categories as follows.

- Category 1 Well formed granulomas without necrosis
- Category 2 Granulomas with necrosis
- Category 3 Degenerating granulomas with predominant necrosis
- Category 4 Polymorphonuclear cells with epithelioid histiocytes/ granulomas

AFB staining was done by ziehl neelsen staining and correlated with the above categories.

Data thus collected was analysed.

RESULTS

A total of 114 patients with superficial lymphadenitis were referred for FNAC. Out of these 83 were suspected cases of tuberculosis. Out of these 75 could be diagnosed on FNAC and two were added later when they were biopsied after not responding to antibiotics, making a total of 77 cases(92.7%) out of 83 suspected. The male to female ratio was 1:1.27.

Table 1. Distribution of cases of superficial lymphadenitis referred for FNAC

	Clinical Diagnosis	FNAC diagnosis	Final diagnosis*
TB	83	75	77
Reactive	18	27	25**
Metastasis	13	12	12
Total	114	114	114

*Based on various investigations like radiology , cytology, tissue biopsy etc

**Includes one case of Kimura's disease

Table 2. Distribution of 83 suspected cases of tuberculosis on FNAC

Impression on FNAC	Number of cases	Percentage
Reactive	09	10.8%
TB	74	89.2%
Metastasis	00	00
Total	83	100%

Table 3. Agewise distribution of 77 cases of tuberculous lymphadenitis

Age group	Number of cases	Percentage
10-20 yrs	02	2.5%
20-30 yrs	17	22.1%
30-40 yrs	31	40.3%
40-50 yrs	13	16.9%
50-60 yrs	14	18.2%
Total	77	100%

DISCUSSION

Tuberculosis has been known to exist in humans since ancient times. The emergence of HIV, MDR and occupational lung diseases, has substantially added new dimensions to the problem. India has a high burden of

cases, sharing a major part of global disease burden. Due to the high burden of cases, empiric treatment is common and justifiable here. Though empiric, treatment is justified by various supportive even if non confirmatory investigations, with fine needle aspiration cytology being mainstay.

Table 4. Sitewise distribution of 77 cases of tuberculous lymphadenitis

Site	Number of cases	Percentage
Cervical	45	58.4%
Supraclavicular	15	19.5%
Axillary	10	13%
Inguinal	06	7.8%
Generalised	01	1.3%
Total	77	100%

Sexwise distribution of cases

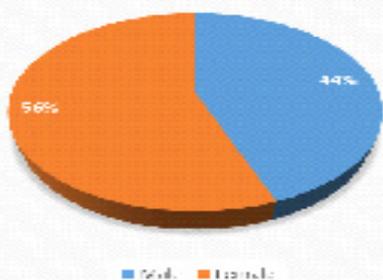


Table 5. Cytomorphological distribution of cases

Pattern	Number of cases	Percentage
Category 1	18	24%
Category 2	45	60%
Category 3	10	13.3%
Category 4	02	2.7%
Total	75	100%

Table 6. Correlation of cytormorphology with AFB positivity

Site	Number of cases	Number of AFB positive cases
Category 1	18	02(11.1%)
Category 2	45	33(73.3%)
Category 3	10	07(70%)
Category 4	02	01(50%)
Total	75	43(57.3%)

However, fine needle aspiration has its limitation of being a blind procedure and depending on skills of aspirator. Overlapping cytormorphological features of various

other granulomatous diseases increases the uncertainty. However, it has added benefit of subjecting the material obtained for various confirmatory investigations such as AFB staining, culture and PCR. AFB staining being non expensive, time saving and requiring less expertise compared to other confirmatory investigations should be offered whenever possible.

Table 7. Distribution of cases according to bacteriological index

Pattern	BI 1	BI 2	BI 3	BI 4	BI 5	BI 6	Total
Category 1	01	01					02
Category 2	19	14					33
Category 3		02	05				07
Category 4		01					01
Total	20	18	05				43

Figure 1: Well formed granulomas with reactive lymphoid cells in the background (H & E, X40)- Category 1

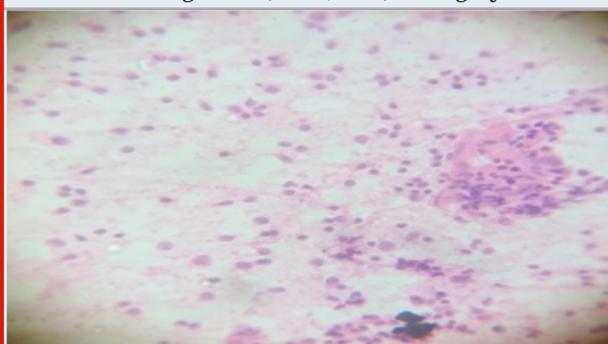
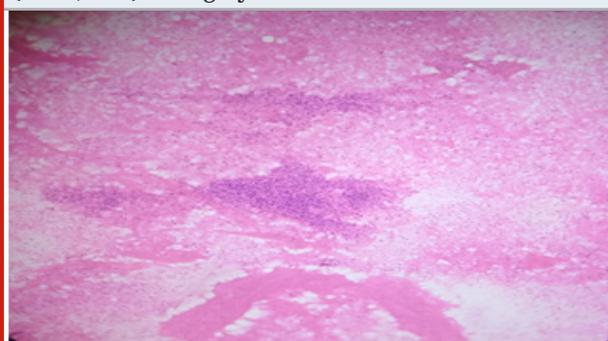


Figure 2: Granulomas with necrosis (H & E, X10)- Category 2



Various studies have shown AFB positivity in aspirated material ranging from 45 to 75 percent, being 57.3% in the present study, which indicates a substantial number. The diagnostic yield on smears can be increased by using methods such as concentration, bleaching and fluorescent staining. Autofluorescence on pap stained smears have shown promising results. Sharma et al suggested using a second decolorized smear with necrosis to increase the diagnostic yield. Radio-guided aspiration can be utilized in assessing deep seated lesions and increasing accuracy

of aspiration in superficial lesions -Even though AFB positivity in category 3 is low, these patients represent the one with good immunity and hence would benefit from timely empiric antitubercular treatment. Many studies on related aspects of Tuberculosis were reported. Dholakia et.al. reported on Drug-Resistant Tuberculosis. Singhal et. al. reviewed on Reasons for Non-Compliance among Patients Treated under Revised National Tuberculosis Control Programme. Gupta et. al. reported on 'molecular biology technique combined with fine needle aspiration cytology in tubercular lymphadenitis.

Figure 3: Predominant Necrosis (Giemsa, x10)-Category 3

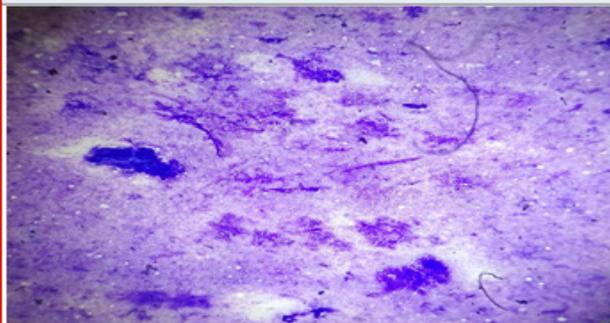


Figure 4: Granuloma with polymorphs in background (H & E, X40) – Category 4

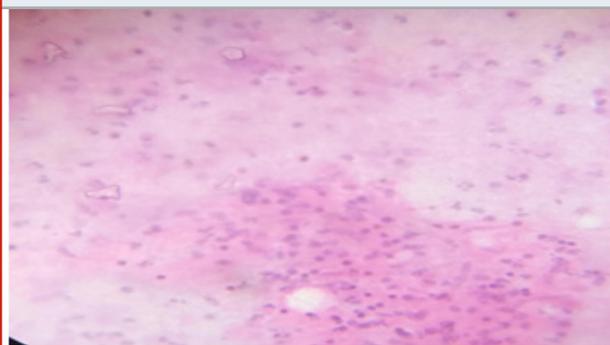
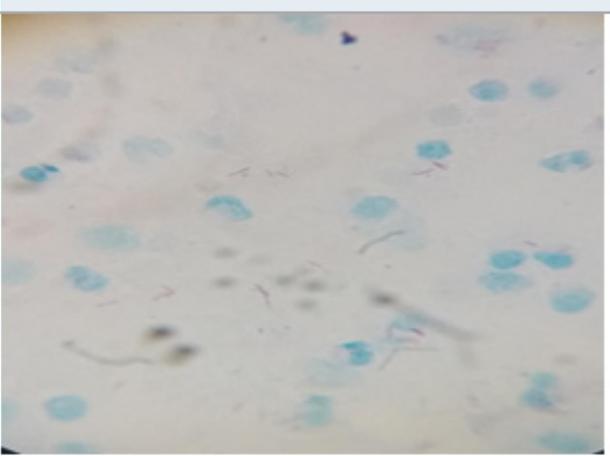


Figure 5: AFB positivity 3+(ZN,X100)



CONCLUSION

To conclude Fine needle aspiration should be offered to patients with suspicious lesions as not only cytomorphology helps to reach a diagnosis, but availability of material for ancillary investigations is an added advantage. Confirmation of diagnosis on AFB staining, gives further assurance to treating physician.

Conflicts of Interest: None

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