



EVALUATION OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) BY USING ZIEHL-NEELSEN (ZN) STAIN FOR THE DIAGNOSIS OF EXTRA PULMONARY TUBERCULOSIS IN A TEACHING HOSPITAL OF RURAL SETUP

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ABSTRACT

BACKGROUND: Tuberculosis is one of most common infectious diseases in India, which is causing economic burden despite being easy in diagnosis and treatment. India has the highest burden of tuberculosis according to WHO, 2017 estimates (2.79 million out of 10.4 million world wide).

PATIENTS AND METHODS: Fine needle aspiration cytology for peripheral lymphadenopathy, breast lesions, thyroid lesions and superficial swellings were done using Ziehl–Neelsen (ZN) stain for a period of one year between March 2016 to February 2017 in the department of Pathology.

RESULTS: Out of 132 cases 21.21% showed positive for acid fast bacilli. Lymphnodes constitute majority of the cases followed by Breast abscess.

CONCLUSION: ZN stain plays a major role in confirming the diagnosis of extra pulmonary tuberculosis. Thus recommending implementation of mandatory ZN staining for all the FNAC cases for better and confirmed diagnosis of extra pulmonary tuberculosis cases and also provides a ready reference to decide whether the sample has to be sent for testing MDRTB.

KEYWORDS : Tuberculosis, Fine Needle Aspiration Cytology, Ziehl-Neelsen stain, Lymph nodes, Breast abscess.

INTRODUCTION

Tuberculosis is one of most common infectious diseases in India, which is causing economic burden on India despite being easy in diagnosis and curable. India has the highest burden of tuberculosis according to WHO, 2017 estimates (2.79 million out of 10.4 million world wide).¹ Programmes like Revised National Tuberculosis Control Programme (RNTCP) playing a major role in control, diagnosis, surveillance and treatment of tuberculosis. Extra pulmonary tuberculosis also contributes to a significant number of cases of tuberculosis in view of HIV and other immunocompromised conditions. RNTCP adopted more sensitive staining techniques like Auramine rhodamine at some of the Designated Microscopy Centres (DMC) and extensive implementation of drug resistant studies for recurrent smear positive cases. ZN stain still plays a major role in diagnosis and surveillance of tuberculosis. In India and other developing countries tubercular lymphadenopathy continues to be the most common form of extra pulmonary tuberculosis² and in a study done by Pooja Singh Gaur et al³ showed 45.5% of extra pulmonary TB cases in a hospital based study. Our study includes Ziehl–Neelsen staining on the smears of fine needle aspiration of cases of lymphnodes, pus aspirated from other peripheral lesions. In our present study, out of 132 cases 21.21% showed positive for acid fast bacilli. Lymphnodes constitute majority of the cases in our study followed by Breast abscess.

PATIENTS AND METHODS

Fine needle aspiration cytology for peripheral lymphadenopathy, breast lesions, thyroid lesions and superficial swellings were done using Ziehl–Neelsen (ZN) stain during one year period between March 2016 to February 2017 in the department of Pathology. Smears made from granulomatous lymphadenopathy, suppurative lymphadenopathy, pus aspirated from the breast abscess, superficial swellings of the body and also pus aspirated from thyroid were included in the present study irrespective of age, gender or previous or family history of tuberculosis. Four smears were obtained from each patient. One smear for each patient was air dried and rest of the smears were alcohol fixed. Air dried smear was stained by using Ziehl–Neelsen (ZN) technique after heat fixation. Alcohol fixed smears were stained with Haemotoxylin and Eosin stain. Remaining 2 smears were kept for reference in case of doubt. ZN stain slides were studied under oil immersion for a minimum of 100 fields. Slides were reported as Negative for Acid fast bacilli (AFB)

after examining minimum 100 oil immersion fields. Presence of even single bacilli was reported as positive for Acid fast Bacilli.

RESULTS

A total of 132 patients were studied for a period of one year between March 2016 and February 2017 at the department of Pathology for identification of tubercle bacilli in fine needle aspiration smears using ZN stain. One hundred and fifteen (87.12%) were from lymphnode aspirations and 17 (12.87%) constitute 4 cases of breast abscess, 2 cases of thyroid lesions and 11 cases of infected sebaceous cysts. Out of 115 cases 18 cases were reported as suppurative lymphadenopathy and 97 cases were reported as granulomatous lymphadenopathy.

Ziehl–Neelsen stained smears show positive for AFB in 21.21%(28) of cases. Out of 26 lymphnode positive cases, 22 cases of granulomatous lymphadenopathy, 4 cases of suppurative lymphadenopathy, 2 cases of breast abscess showed Acid fast bacilli. All the 11 cases of infected sebaceous cysts, 2 cases of thyroid abscess and 89 cases of lymphnode were negative for presence of AFB. A case of thyroid abscess showed granulomas and other case showed predominantly pus cells, both the cases were negative for AFB.

Table 1: Analysis of ZN smears from various specimens

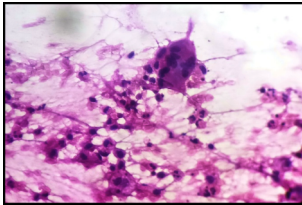
Site	Cytology diagnosis	Positive for AFB		Negative for AFB		Total	
		NO.	%	NO.	%	NO.	%
Lymphnodes	Granulomatous lymphadenitis	22	16.67	75	56.81	97	73.49
Lymphnodes	Suppurative lymphadenitis	4	03.03	14	10.61	18	13.63
Breast Abscess	Granulomatous Mastitis	2	01.51	2	01.51	4	3.03
Thyroid lesion	Granulomatous thyroiditis	0	0	1	0.76	1	0.76
Thyroid lesion	Abscess	0	0	1	0.76	1	0.76
	Infected Sebaceous cyst	0	0	11	8.34	11	8.33
Total		28	21.21	104	78.79	132	100.00

DISCUSSION

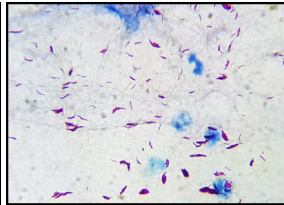
Twenty eight out of 132 of our patients whose FNAC slides stained with ZN Stain were positive. In our observation, 22.6% of lymph node FNAC showed positive AFB with ZN stain, whereas study done by Lakhey et al⁴ showed 58.1 % positivity, 44% positivity seen in Majeed MM et al⁵, 10.14% positivity in study done by Uwimana I et al⁶ and 26.64% positivity in a study done by Brijesh T et al⁷ on lymphnode FNAC slides. In our study, most of the lymphnode positive cases were scanty cellular smears with dispersed epithelioid cells or occasional clusters of epithelioid cells and caseous necrosis as was also observed by Lakhey et al³ and Majeed MM et al⁵. Out of 2 positive AFB cases of breast, one patient had surgery for breast enhancement surgery. Tuberculosis mastitis was also reported by Spyridon M et al⁸ and Prakash HM et al⁹.

CONCLUSION

Though the study does not represent all the cases of extrapulmonary tuberculosis, our study emphasises up on using a simple and cost effective stain like ZN stain plays a major role in confirming the diagnosis of extrapulmonary tuberculosis. Thus recommending implementation of mandatory ZN staining for all the FNAC cases for better and confirmed diagnosis of extrapulmonary tuberculosis cases and also provides quick turn around time to decide whether the sample has to be sent for testing MDRTB.



Epithelioid cells in a pus obtained from Lymph node aspirate



Acid fast bacilli in an aspirate from Lymph node

REFERENCES

1. Global tuberculosis control, WHO report, 2017; Geneva: WHO, 2017. World Health Organization. Obtained at http://www.who.int/tb/publications/global_report/en/
2. Sharma SK and Mohan A. "Extrapulmonary tuberculosis" *Indian J Med Res* 2004;120(4):316-353.
3. Pooja SG, Suryakant, Ravi B, Seema S, Prachi S and Shruti A. "Incidence and clinical profiles of pulmonary and extrapulmonary tuberculosis patients in North Indian population – A hospital based retrospective study" *International journal of research and development pharmacy and life science* 2017; 6(5): 2773-2778.
4. Lakhey M, Bhatta CP, Mishra S. "Diagnosis of Tubercular Lymphadenopathy by Fine Needle Aspiration Cytology, Acid-Fast Staining and Mantoux Test". *J Nepal Med Assoc* 2009;48(175): 230-233.
5. Majeed MM and Bukhari MH. "Evaluation of granulomatous inflammation on fine needle aspiration cytology using special stains" *Patholog Res Int.* 2011;2011:851524. doi: 10.4061/2011/851524.
6. Uwimana I, Gatabazi JB, Mukabayire O, Bigirimana V, Ngendahayo L, Mubako TVK et al. "Fine needle aspiration cytology (FNAC) as useful tool useful tool in the diagnosis of suspected tuberculous lymphadenitis in Rwanda" *Mycobact Dis* 2009; 6(1): 1-4.
7. Brijesh T, Ravi M, Jitendra SN. "Correlation of various techniques in diagnosis of Tuberculous lymphadenitis on Fine needle aspiration cytology" *Pathology research international* 2013; Article ID 824620: 1-4.
8. Spyridon M, Dionysia L, Thomas G, Constantine, Dimitrakakis, Irini P, Aris A "Breast tuberculosis: Diagnosis, management and treatment". *International Journal of Surgery Case Reports* 2012: 548– 550.
9. Prakash HM, Jyothi BL, Ramkumar K, Konapur PG, Shivarudrappa AS and Subramaniam PM. "The value of systematic pattern analysis in FNAC of breast lesions: 225 cases with cytohistological correlation" *Journal of Cytology* 2011; 28(1): 13-18.