

COMPARISON OF VALIDITY OF FNAC AND ZIEHL-NEELEN STAINS IN DIAGNOSING CERVICAL TUBERCULOUS LYMPHADENITIS

Aisha Qaiser, Muhammad Sohail Babar Niazi*, Zaheer Ul Hassan*, Shahid Farroq Khattak*, Shahid Iqbal**, Sunarays Akhtar***

Fauji Foundation Hospital, Peshawar Pakistan, *Combined Military Hospital Peshawar/National University of Medical Sciences (NUMS) Pakistan, **Combined Military Hospital Gujranwala/National University of Medical Sciences (NUMS) Pakistan, ***PAF Hospital, Lahore Pakistan

ABSTRACT

Objective: To compare the validity of FNAC & ZN staining in diagnosing tuberculous lymphadenitis taking mycobacterial culture as gold standard.

Study Design: Cross sectional study.

Place and Duration of Study: Pathology department, Fauji Foundation Hospital Peshawar, from Oct 2019 to Sep 2020.

Methodology: This study includes 100 patients with enlarged cervical lymph nodes who presented as outdoor patients. After routine baseline & radiological investigations, FNAC & ZN staining was carried out, followed by mycobacterial culture.

Results: FNAC of tuberculous patients was positive in 56 (56%) patients while 24 (24%) patients revealed positive mycobacterial culture. Inpatients with positive culture, 77 (77%) were FNAC positive and 23 (23%) were negative on cytology.

Conclusion: Fine needle aspiration is more sensitive & specific test than Ziehl-Neelsen staining.

Keywords: Acid Fast Bacilli, Fine needle aspiration cytology, Hematoxylin & eosin stain, Ziehl-Neelsen staining.

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INTRODUCTION

Tuberculosis (TB), a contagious disease is one of the leading cause of morbidity as well as mortality in Pakistan. It is a bacterial infection caused by mycobacterium tuberculosis that spreads commonly from cough and sneeze of infected persons.¹ Males are affected more than females especially with advancing age.²

Cervical tuberculous lymphadenopathy is one of the most common presentation of extra pulmonary tuberculosis.³ Since cervical lymph nodes enlargement is mostly superficial therefore it is easy to perform fine needle aspiration cytology for obtaining diagnostic material that is further aided by ZN staining.^{4,5} FNAC is rapid, cost-effective & reliable method of staining especially in those setups where culture takes long time to obtain results.^{6,7} The objective of study is to compare the validity of FNAC & ZN staining in diagnosing tuberculous lymphadenopathy taking mycobacterial culture as gold standard. The rationale of this study is that FNAC is more helpful in evaluation & definite in diagnosis as compared to ZN staining. It helps in better decision making for better treatment options.

METHODOLOGY

This cross sectional study was performed in Pathology department of Fauji Foundation Hospital,

Peshawar, from October 2019 to September 2020. Using non-probability purposive sampling technique a total of 100 cases of clinically suspected patients of tuberculous lymphadenitis were selected.

Inclusion Criteria: All patients with positive family history & clinical signs & symptoms (cough with or without hemoptysis, fever, weight loss, dyspnea) of tuberculosis.

Exclusion Criteria: The patients on anti-TB treatment.

The patients of both genders (male & female) of age range (15-60 years) were selected. The history, sign & symptoms & demographic data was collected from all patients. After ultrasound scan of neck nodes, FNAC was done. At least two smears were developed for every case. One smear was prepared for H&E staining and the second smear for ZN staining. For mycobacterial culture, the residuary aspirate was used.

For epithelioid granulomas, necrosis & presence of AFB (H&E & ZN stained) smears were put to examination.

To perform mycobacterial culture, the specimens were subjected to Lowenstein-Jensen (LJ) Medium. It is a glycerated egg based medium used as selective medium for the growth of mycobacterium tuberculosis. After inoculation, it takes maximum of four weeks for the appearance of colonies (brown, granular "buff" colonies).

Correspondence: Dr Muhammad Sohail Babar Niazi, ENT Department, Combined Military Hospital Peshawar Pakistan

The criteria for confirmed diagnosis of tuberculous lymphadenitis included necrotic epithelioid cell granuloma with positive AFB on ZN stain and positive mycobacterial culture. Data was tabulated & analysis was done by using SPSS version 20.

RESULTS

A total of 100 cases of patients with clinical suspicion of tuberculous lymphadenopathy reporting to hospital. Age of the patient ranged from (15-65 years) with mean age is 42 years. The most commonly affected individuals were of 4th decade of life. Out of 30% of the patients were less than 30 years while 8% were less than 20 years. There were 60 males & 40 females with male female ratio is (3:2). Most common associated symptoms were fever & cough with 10% having past history & 13% had history of TB contact.

FNAC of tuberculous patients was positive in 56 (56%) patients while 24 (24%) patients revealed positive mycobacterial culture. Inpatients with positive culture, 77 (77%) were FNAC positive and 23 (23%) were negative on cytology. In case of FNAC the sensitivity, specificity, positive predictive value and negative predictive value of FNAC were 77%, 43%, 30% and 83% respectively whereas for Zeil Nelson staining for AFB sensitivity, specificity, positive predictive value and negative predictive value were 15%, 97%, 74.2% and 77.5% respectively.

Table-I: Diagnostic efficacy of FNAC against bacterial culture.

		Growth on Culture		p-value
		Yes (%)	No (%)	
FNAC	Epithelioid cells seen	18 (76.9)	39 (66.4)	<0.001
	Epithelioid cells not seen	5 (23)	38 (49.33)	
	Total	23 (100)	77 (100)	

Table-II: Result of ZN staining for Acid fast bacillus against bacterial culture.

		Growth on Culture		p-value
		Yes (%)	No (%)	
Zeil Nelson stain (Acid fast Bacillus)	+ve	3 (14.9)	2 (2)	<0.001
	-ve	20 (85.1)	75 (97.5)	
	Total	23 (100)	77 (100)	

DISCUSSION

Both FNAC & ZN stains play an important role in preoperative assessment of patients in cervical tuberculous lymphadenitis. Aim of this study is to evaluate diagnostic accuracy of FNAC & ZN stains & to study the comparison of its utility, dependability & precision

of diagnosis in suspected cases of tuberculous lymphadenitis. The study reveals that the patients (100 in number) were referred to Pathology Department of Fauji Foundation Hospital for lymph nodes FNAC. Since most of the patients fall within age range of (30-50) years, the disease prevalence is associated with advancing age. The gender distribution is associated with poor nutritional status, decreased immunity & personal habits (smoking etc).

The study indicates mostly cervical lymph node involvement followed by supraclavicular & axillary lymph nodes. Presence of clusters of epithelioid cells (granulomas) & caseous necrosis is the hallmark of cytomorphological features of tuberculosis on FNAC. FNAC has a documented sensitivity in endemic areas of 97-100% & specificity ranges from 88-100% while in non-endemic the sensitivity is found low. In this study the sensitivity, specificity, positive predictive value & negative predictive value of FNAC are 76.9%, 43.1%, 30.4% and 83.2% respectively. The negative culture & positive cytomorphological features (H&E) indicate non tuberculous granulomatous inflammation inadequate amount of viable mycobacteria to allow growth on culture medium.

The results shown in the study were similar to the research conducted by Prasad *et al* and Saboorian *et al*.^{8,9} Roskell *et al* and Getachew *et al* were also convinced of the efficacy of FNAC in the diagnosis of tuberculous lymphadenitis.^{10,11} Hashmi *et al* conducted a similar study about the role of FNAC in lymphadenopathy with similar results to our study.^{12,13} FNAC has also been shown to be a quite accurate and useful tool in diagnosing other head and neck tumors as well.¹⁴⁻⁸

CONCLUSION

The accurate technique to diagnose cervical tuberculous lymphadenitis is FNAC having high sensitivity & specificity than ZN stain. Culture should only be used in suspicious cases of mycobacterial infection and gives a reliable technique for the identification of various species of mycobacterium. and disease.

Conflict of Interest: None.

Authors' Contribution

AQ: Conceived the main idea, developed study design, MSBN: Bibliography, ZUH: Manuscript drafting, SFK: Helped in data interpretation, SI: Research supervisor, SA: Developed study tool, literature survey

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