ORIGINAL RESEARCH PAPER

Volume-7 | Issue-7 | July-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CYTODIAGNOSIS OF TUBERCULOUS LYMPHADENITIS – A STUDY OF 371 CASES

Pathology

Dr. Neha Mukesh Goel* Assistant Professor,Department of Pathology, BKL Walawalkar Rural Medical College and Hospital, Taluka -Chiplun, Dist-Ratnagiri,*CorrespondingAuthor

ABSTRACT

Background: Tuberculosis is rampant especially in developing country like India. Lymphadenitis is the commonest extra pulmonary manifestation of tuberculosis and lymph nodes are easily accessible to fine needle aspiration. Fine needle aspiration cytology, being a simple outpatient procedure is used for diagnosis of tuberculous lymphadenitis.

Aims: The present study was undertaken to study the utility of fine needle aspiration cytology for the diagnosis of tuberculous lymphadenitis, different cytomorphological patterns in HIV positive and negative patients and to assess correlation between FNAC and Ziehl-Neelsen (Z-N) staining in diagnosing tuberculous lymphadenitis.

Methods: In a span of 4 years, the present study was carried out in 371 patients of suspected tuberculous lymphadenitis. Patients of all age group were included in this study.

Results: There were 167 males and 204 females. Maximum number of cases were in the age range of 21-40 years. The most common site of enlarged lymph nodes was cervical group of lymph nodes. The most common cytomorphological pattern was Epithelioid cell granulomas with caseous necrosis in both HIV positive and negative patients. In immunocompromised patients, smears with only caseous necrosis or only neutrophils with histiocytes admixed with necrotic background was also noted. Cases with caseous necrosis or only neutrophils showed higher AFB positivity. Histopathology and cytology correlation was available in only 9 cases and the accuracy rate was 100%.

Conclusions: Thus fine needle aspiration cytology is a reliable diagnostic tool in helping to avert the more invasive surgical procedures undertaken in the diagnosis of tuberculous lymphadenitis. Ziehl-Neelsen stain for identification of acid fast bacilli should be incorporated as an adjunct to increase diagnostic accuracy of tuberculous lymphadenitis.

KEYWORDS

Fine Needle Aspiration Cytology, Tuberculous Lymphadenitis, Caseous Necrosis, AFB

INTRODUCTION

Mycobacterium tuberculosis infects about one third of the world's population and kills about 3 million patients each year and so is the single most important infectious cause of death[1]. Fine needle aspiration cytology, being a rapid, inexpensive, cost-effective, safe and simple outpatient procedure is well accepted by patients and has practically no complications [2,3]. So the present study was undertaken to study the utility of fine needle aspiration cytology and various cytomorphological presentations in reference to Ziehl-Neelsen staining in tuberculous lymphadenitis.

MATERIAL AND METHODS

The present study was carried out in 371 patients of suspected of tuberculous lymphadenitis, over a period of 4 yrs. All the selected patients were subjected to detailed clinical history and clinical examination comprising of following investigations- Rapid ELISA test, chest radiography, fine needle aspiration cytology and/or histopathological examination and smear microscopy for AFB.

All the 371 cases, irrespective of age and sex were subjected to fine needle aspiration cytology. Aspiration was done as an OPD procedure using a 22-gauge needle with standard precautions. Four to five smears were obtained by using multiple passes. Both air dried and alcohol-fixed smears were prepared. Smears obtained were stained with Hematoxylin and eosin stain (H&E) for cytology and Zeil-Neelson (ZN) stain for acid fast bacilli (AFB).

The criteria for diagnosis of tuberculosis were taken as: (i) presence of epithelioid cell granulomas with or without caseous necrosis (ii) presence of necrotic material only but positive ZN staining for AFB, (iii) presence of necrotic material, negative AFB staining but positive culture for AFB [4].

RESULTS

Table 1: Age and Sex distribution of cases

Age group(yrs)	No.of cases			Percentage
	Male	Female	Total	
0-10	7	10	17	5
11-20	19	32	51	14
21-30	**49**	**85**	**134**	**36**
31-40	**65**	**41**	**106**	**29**
41-50	18	16	34	9
51-60	4	9	13	3
61-70	4	9	13	3
71-80	**1**	**2**	**3**	**1**
Total	167	204	371	100

The maximum number of cases (65%) were in the age group of 21-40 yrs while the minimum number of cases were in the age group of 71-80 yrs. The youngest patient was 9 month old male while oldest patient was 75 yrs old male. The male to female ratio was[1:1.2] as shown in Table-1.

Table 2: Site distribution of cases

Site of FNAC of lymph node	Total	%
Cervical	**338**	**91**
Axillary	29	7
Inguinal	2	1
Generalised	2	1
Total	371	100

The most common site of enlarged lymph nodes was cervical lymph nodes followed by axillary, inguinal and generalized lymphadenopathy as shown in Table-2.

A diagnosis of tuberculous lymphadenitis was made when smears showed (i) epithelioid cell granulomas with or without caseous necrosis (ii) necrotic material only but positive ZN staining for AFB, (iii) necrotic material, negative AFB staining but positive culture for AFB[4].

Table 3: Cytomorphological features in tuberculous lymphadenitis correlating with AFB positivity

Sr No.	Cytomorphological features	No. of cases with %	AFB positivity cases with %
1.	Epithelioid cell granulomas without caseous necrosis	115 (31%)	17 (14.78)
2.	**Epithelioid cell granulomas with caseous necrosis**	**253 (68.19%)**	150 (59.29)
3.	Necrosis without granulomas	3 (.81%)	**3 (100%)**
	Total	371	170 (45.82%)

In the present study, three cytomorphological patterns were found as shown in Table-3. Most prevalent cytomorphological pattern was Epithelioid cell granulomas with caseous necrosis. AFB positivity was seen maximum in third group with necrosis only, followed by second group with Epithelioid cell granulomas with caseous necrosis and least

AFB positivity was seen in first group with Epithelioid cell granulomas without caseous necrosis.

Table 4: Distribution of cases in relation to age and sex in HIV positive patients

Age group (yrs)	M	F	Total
0-10	-	-	-
11-20	-	2	2
21-30	9	7	16
31-40	**21**	**6**	**27**
41-50	3	2	5
51-60	1	1	2
61-70	-	1	1
71-80	-	-	-
Total	34	19	53

53 out of 371 patients (14%) with tuberculous lymphadenitis were HIV positive. In these patients, there was a male predominance [Male:Female=1.8:1] and maximum no. of cases (50%) were in 31-40 yrs of age group as shown in Table-4. Majority were detected in cervical region [52 out of 53 cases (98%)].

Table 5: Cytomorphological features in tuberculous lymphdenitis in HIV patients

Sr No.	Cytomorphological features	No. of cases with %	AFB positivity cases with %
1.	Epithelioid cell granulomas without caseous necrosis	10 (18.87%)	4 (40%)
2.	**Epithelioid cell granulomas with caseous necrosis**	**40 (75.47%)**	27 (67.5%)
3.	Necrosis without granulomas	3 (5.66%)	**3 (100%)**
	Total	53	30 (56.60%)

So in HIV patients also, most prevalent pattern was Epithelioid cell granulomas with caseous necrosis (75.47%) as shown above in Table-5.

30 out of 53 cases were AFB positive which was seen maximum in third group with necrosis only, followed by second group with epithelioid cell granulomas with caseous necrosis and least AFB positivity was seen in first group with Epithelioid cell granulomas without caseous necrosis.

Over all, cases with caseous necrosis or only neutrophils showed high AFB positivity (Table-3 & 5). So necrosis was the only independent contributing factor towards AFB positivity [5].

Histopathology and cytology correlation was available in only 9 cases and accuracy rate was 100%.

DISCUSSION

In the present study, youngest patient was 9 months old and oldest was 75 years of age. These figures come in close comparison to the study of Das DK et al [5], and Kanhere [6]. In the study of Gupta *et al*[7]., the younger was 5 months old and oldest was 95 years old, whereas Mitra *et al*[8] reported the youngest patient aged 6 months old with 69 years old as the oldest.

Maximum number of cases (65%) in the present study , are in the age range of 21 – 40 years. Similar observations have been made in other studies [5,6,7,8,9,10,11,12.] Ahmad S et al [13], however, found maximum cases of tuberculous lymphadenitis in younger age group (11-20yrs). In present study, out of 371 cases studied, 167 were males and 204 were females giving a male to female ratio of 1:1.2. This corresponds well with the findings of most of the authors[5,8,11,12.] However, Singh UR et al [4] noted equal population of male and females while Rajsekaran S et al[10], Ahmad S et al[13] and Bailey et al [14]" noted a male predominance. This difference may be due to different study population.

The most common site of enlarged lymph nodes was cervical lymph nodes followed by axillary, inguinal and in the present study. Similar finding was observed by other authors [5,8,10,11,12].

In the present study, three cytomorphological patterns were found. Most common cytomorphological pattern in our study was epithelioid granulomas with caseous necrosis in 68.19% cases.. This correlated with the study by other authors.[7,8,12] Maximum AFB positivity was seen in smears revealing necrosis only without epithelioid cell granulomas. Similar observations have been made in other studies [4,5,7,8,10,12,15,16]. Das et al[17] also observed that foci of necrosis were associated with marked proliferation of tubercle Bacilli and infiltration of polymorphs whereas lymphocytes, epithelioid cells, and multinucleated giant cells are likely to have some role in limiting the proliferation of AFB. It appears that the chances of finding AFB are greater when pus or caseous material is aspirated while the aspiration of caseous material is almost always indicative of tuberulosis and merits an active search for AFB.[18]

Maximum cases of HIV positive tuberculous lymphadenitis were in the age group of 21-40 yrs [43 out of 53 cases (81%)]. Our findings are comparable to other authors [10,19,20,21,22]. There were 34 males and 19 females [64% male patients]. So male predominance was noted. Similar male predominance was noted by other authors [10,19,21,23,24].

Histopathology and cytology correlation was available in only 9 cases and accuracy rate was 100%. Similar findings were observed in other studies [11,15,25,26].

To conclude, fine needle aspiration cytology is a simple, rapid, inexpensive, cost-effective, safe and highly sensitive procedure to diagnose tuberculous lymphadenitis. The sensitivity can be further increased by complementing cytomorphology with acid fast staining. It is an economical and convenient alternative to open biopsy of lymph nodes.

References

[1] Bloom BR, Murray CJL. Tuberculosis : commentary on a reemergent killer. Science 1992; 257 :1055.
[2] Gadre DV, Singh UR, Saxena K, Bhatia A, Talwar V. Diagnosis of tubercular cervical lymphadenitis by FNAC, microscopy and culture. Ind J Tub 1991; 38 : 25-27.
[3] Gopinat. Tuberculosis in the Indian scene- From a clinician's angle. J Assoc Physicians India 1989; 37 : 525-528.
[4] Singh UR, Bhatia A, Gadre DV, Talwar V. Cytologic diagnosis of tuberculous lymphadenitis in children by fine needle aspiration. Ind J Paed 1992; 59: 115 – 118.
[5] Das DK, Subhash Gupta. Fine Needle Aspiration Cytodiagnosis of Hodgkin's disease and it's subtypes. Acta Cytol 1990; 34(3): 329 – 340.
[6] Kanhere S. Evaluation of fine needle aspiration cytology in lymphadenopathy cases. Ind J Surg 1994; 56 (4) : 169 – 174.
[7] Gupta R, Dewan D, Suri J. Study of incidence and cytomorphological patterns of tubercular lymphadenitis in a secondary care level hospital of Jammu Region. Indian J Pathol Oncol 2015;2:161-4.
[8] Mitra SK, Misra RK, Rai P. Cytomorphological patterns of tubercular lymphadenitis and its comparison with Ziehl-Neelsen staining and culture in eastern up. (Gorakhpur region): Cytological study of 400 cases. J Cytol 2017;34:139-43
[9] Gupta AK. Reliability and Limitations of Fine Needle Aspiration cytology of Lymphadenopathies- An analysis of 1,261 cases. Acta cytol 1991; 35(6): 777 – 783.
[10] Rajaskaran S, Gunsekaran M, Jayakumar DD, Jeyaganesh D, Bhanumati V. Tuberculosis cervical lymphadenitis in HIV positive and negative patients. Ind J Tub 2001; 48: 201 – 204.
[11] Khajuria R, Goswami KC, Singh K, Dubey VK. Pattern of Lymphadenopathy on Fine needle aspiration cytology in Jammu. JK Science 2006 ; 8 (3): 157-159.
[12] Badge SA, Ovhal AG, Azad K, Meshram AT. Study of Fine-needle aspiration cytology of lymph node in rural area of Bastar District, Chhattisgarh. Medical journal of Dr D.Y. Patil Vidyapeeth 2017; 10 (2): 143-148.
[13] Ahmad SS, Akhtar S, Akhtar K, Naseem S, Mansoor T, Khalil S. Incidence of Tuberculosis from Study of Fine Needle Aspiration Cytology in lymphadenopathy and Acid Fast Staining. Ind J Comm Med 2005;30(2)
[14] Baily TM, Akhtar M, Ali MA. Fine needle aspiration biopsy in the diagnosis of tuberculosis. Acta cytol 1985; 29(5): 732 – 736.
[15] Dasgupta A, Ghosh RN, Poddar AK, Mukherjee C, Mitra PK, Gupta G, et al. FNAC of cervical lymphadenopathy with special reference to tuberculosis. J of Ind Med Assoc 1993; 982(2): 44 -46.
[16] Vanisri HR, Nandini NM, Sunila R. Fine needle aspiration cytology findings in HIV lymphadenopathy. Ind J Pathol Microbiol 2008;51(4): 481-484.
[17] Das DK. Fine needle aspiration cytology in the diagnosis of tuberculous lesions. Lab Med 2003;31:625-32
[18] Prasoon D. Acid-fast Bacilli in fine needle aspiration smears from tuberculous lymph nodes. Where to look for them. Acta Cytol 2000;44:297-300.
[19] Jain SK, Aggarwal JK, Rajpal S, Baveja U. Prevalence of HIV infection among Tuberculosis patients in Delhi- A sentinel surveillance study. Ind J Tub 2000; 47: 21.
[20] Bottles K, McPhau LW, Volberding P, Fine needle aspiration biopsy of patients with AIDS experience in an outpatient clinic. Ann Intern Med 1988;108:42-5.
[21] Shenoy R, Kapadi SN, Pai KP, Kini H, Mallya S, Khadilkar UN,et al.Fine needle aspiration diagnosis in HIV related lymphadenopathy in Mangalore, India. Acta Cytol 2002;46:35-9.
[22] Tripathi S, Joshi DR, Mehendale SM, Menon P, Joshi AN, Ghorpade SV, et al. Sentinel surveillance for HIV infection in tuberculosis patient in India. Ind J Tub 2002; 49: 17.
[23] Lapuerta P, Martin S, Ellison E. Fine needle aspiration of peripheral lymph nodes in patient with tuberculosis and HIV. Am J Clin Pathol 1997; 107: 317 – 320.
[24] Martin Bates E, Tanner A, Suvarna SK, et al. Use of FNA cytology for investigating lymphadenopathy in HIV positive patient. J Clin Pathol 1993; 46: 564 – 566.
[25] Bandopadhayay SN. Role of Fine Needle Aspiration Cytology in the diagnosis of cervical lymphadenopathy. IJO and HNS 1996; 48(4): 289 -294.
[26] Bhargava P, Jain AK. Chronic cervical lymphadenopathy- a study of 100 cases. Ind J Surg 2002; 64(4): 344 – 346.