Original Article

Indian Journal of Pathology: Research and Practice
Volume 6 Number 1, January - March 2017
DOI: http://dx.doi.org/10.21088/ijprp.2278.148X.6117.21

FNAC Study of Tuberculosis among HIV Patients: Descriptive Study

Pratima S. Patil*, Indudhara P.B., Narasimhamurthy***, C. Bharat****, Ramesh K.*****

*Consultant Pathologist, Siddhagiri Hospital and Research Center, Kaneri Tal Karveer, Kolhapur. **Assistant professor, Department of Pathology, Subbaiah Institute of Medical Sciences, Shimoga. ***Professor, Department of Pathology, Navodaya Medical College, Raichur. ****Professor& Head, Department of Pathology, *****Associate Professor, Dept. of Community Medicine, VIMS, Bellary.

Abstract

Introduction: Clinical studies have shown the detrimental effects of tuberculosis on the course of HIV infection. The risk of death in HIV-infected patients with tuberculosis was reported to be twice that in HIV-infected patients without tuberculosis, independent of the CD4 count. *Methodology:* The standard procedure was followed making use of 10 ml syringe with 23 gauge needle and as many as possible smears were prepared. Procedure was performed wearing disposable surgical gloves. Hands were washed with soap under running tap water after the procedure. The smears obtained were routinely fixed with ethyl alcohol or air dried according to type of stain to be used. If the smears were inadequate, aspiration was repeated. Smears were then stained by Haematoxylin and Eosin (H & E), May Grunwald Giemsa and ZN stain for acid fast bacilli (AFB). *Results:* In the present study, smears showing both caseous necrosis and epithelioid cell granuloma (CN-ECG) constituted predominant pattern with 19 cases (65.51%), followed by smears showing only epithelioid cell granuloma (ECG) 5(17.24%) and smears showing only caseous necrosis (CN) 5 (17.24%). *Conclusion:* Lymph node cytology is useful for segregating lymphadenopathy cases that needs further evaluation.

Keywords: TB Lymphadenitis; HIV; FNAC.

Introduction

Human immunodeficiency virus is a blood-borne, sexually transmissible virus. The virus is typically transmitted via sexual intercourse, shared intravenous drug paraphernalia, and MTCT, which can occur during the birth process or during breastfeeding.

The most common route of infection varies from country to country and even among cities, reflecting the population in which HIV was introduced initially and local practices. Co-infection with other viruses that share similar routes of transmission, such as hepatitis B, hepatitis C, and human herpes virus 8 (HHV8); also known as Kaposi sarcoma herpes virus [KSHV]), is common.

Corresponding Author: Ramesh K., Associate Professor, Dept. of Community Medicine, Vijayanagara Inst. of Medical Sciences (VIMS) Ballari - 583104 Karnataka.
E-mail: ramspsm@gmail.com

(**Received on** 16.12.2016, **Accepted on** 23.12.2016)

Two distinct species of HIV (HIV-1 and HIV-2) have been identified, and each is composed of multiple subtypes, or clades. All clades of HIV-1 tend to cause similar disease, but the global distribution of the clades differs. This may have implications on any future vaccine, as the B clade, which is predominant in the developed world, is rarely found in the developing countries that are more severely affected by the disease.

In many developing countries, tuberculosis has emerged as the most common opportunistic infection associated with HIV. Up to 54% of AIDS patients in Africa have clinical tuberculosis during the course of HIV infection [1]. Miliary TB or disseminated tuberculosis is an important consideration in patients with generalized lymphadenopathy. As the level of immunosuppression increases in HIV-infected individuals, mycobacteraemia and extra-pulmonary tuberculosis becomes progressively more common [2].

In HIV-infected patients with pyrexia of unknown origin, diagnostic studies should be done to exclude extra-pulmonary tuberculosis. In HIV-infected

individuals intra-abdominal tuberculosis is characterized by visceral lesions, and intra-abdominal lymphadenopathy with necrosis, which is best visualized by computed tomography [3].

Clinical studies have shown the detrimental effects of tuberculosis on the course of HIV infection. The risk of death in HIV-infected patients with tuberculosis was reported to be twice that in HIV-infected patients without tuberculosis, independent of the CD4 count [4].

The high mortality rate among patients with tuberculosis appeared to be due to progressive HIV infection rather than tuberculosis. The degree of immunosuppression is the most important predictor of survival in HIV-infectedpatients with tuberculosis, since negative tuberculin skin tests, prior opportunistic infections, and low CD4 counts are associated with increased mortality [5].

Methodology

Inclusion

All HIV positive patients presenting with lymph node enlargement.

Exclusion

Patients with acutely inflamed lymphnodes and with history of enlargement of less than one week.

Based on the selection criteria HIV positive patients with lymph node enlargement underwent clinical examination and the history was taken. Laboratory findings were carried out for these patients like routine haematological tests, CD4 T cell count.

Fine Needle Aspiration Cytology was carried out. In patients with more than one group of lymph node enlargement, representative nodes (larger in the group) were chosen from each group and were subjected to FNAC.

The standard procedure was followed making use of 10 ml syringe with 23 gauge needle and and as many as possible smears were prepared. Procedure was performed wearing desposable surgical gloves. Hands were washed with soap under running tap water after the procedure. The smears obtained were routinely fixed with ethyl alcohol or air dried according to type of stain to be used. If the smears were inadequate, aspiration was repeated. Smears were then stained by Haematoxylin and Eosin (H & E), May GrunwaldGiemsa and ZN stain for acid fast bacilli (AFB). Special stain such as periodic acid Schiff (PAS) stains was done in selected cases.Grading of AFB was done based on AFB staining pattern proposed by an Indian study.

Grade 1+ = AFB was found after a careful search

Grade 2+ = AFB were singly scattered

Grade 3+ = AFB were found in large numbers arranged in faggots and singly.

Interpretation was Made by Cytopathologist

FNAC is an important diagnostic tool in the evaluation of lymphadenopathy. It is simple and inexpensive and has been widely used all over the world. Fine needle aspiration definitely involves lesser risk to the performer than the open biopsies. A retrospective study done by Burton F et al had indicated that open biopsy is not indicated in HIV or AIDS patients especially with nontender or nonenlarging nodes, though it was a method of choice for diagnosing HIV infection before serological testing was freely available. In present study histopathological diagnosis could be obtained only in few cases. In other cases biopsy was not performed. The findings were recorded on predesigned and pretested proforma.

Data obtained was coded and entered into Microsoft Excel spreadsheet. The categorical data was expressed as rates, ratios and percentages. Continuous data was expressed as mean ± standard deviation (SD).

Results

Table 1 shows the age and sex distribution of cases with tubercular lymphadenitis. Among them 65.52% were males and 34.48% were females. Overall, 41.38% cases had age between 21 to 30 years and 37.93% were aged between 31 to 40 years and similar pattern of age was noted among females (17.24% and 10.34% respectively) whereas among males 27.59% were between 31 to 40 years and 24.14% were aged between 21 to 30 years.

In this study the cases were grouped into three categories based on cytological pattern. They were caseous necrosis only, epithelioid cell granulomas only and caseous necrosis with epithelioid cell granulomas.

The granulomata were composed of syncytial aggregates of oval or fusiform epithelioidhistiocytes with "blunt- ended" and sometimes bent or curved nuclei. Langhan's type giant cells were very occasionally seen.

In the present study, smears showing both caseous necrosis and epithelioid cell granuloma (CN-ECG) constituted predominant pattern with 19 cases (65.51%), followed by smears showing only epithelioid cell granuloma (ECG) 5(17.24%) and smears showing only caseous necrosis (CN) 5 (17.24%).

In the present study out of 75 cases, 29 (38.66%) had tubercular lymphadenitis. Among them, most of the patients (72.42%) had grade ++ (2+) and 13.79% each had grade + (1+) and +++ (3+).

In the present study out of 75 cases, 29 (38.66%) had tubercular lymphadenitis. Among them, 19 patients (65.52%) had CN with ECN cytological pattern. Of these, majority (79%) had ++(2+) AFB. The distribution of other cytological patterns with AFB grades is as shown in table.

Correlation of grading of AFB staining pattern with cytomorphological features of tuberculous lymphadenitis demonstrated the presence of AFB in greater number in smears showing CN pattern and their number decreased with appearance of granuloma.

Table 1: Distribution of tubercular lymphadenitis cases according to age and sex

Age group	Males		Females		Total (n=29)	
	Number	Percent	Number	Percent	Number	Percent
6 to 10	1	3.45	0	0.00	1	3.45
11 to 20	0	0.00	0	0.00	0	0.00
21 to 30	7	24.14	5	17.24	12	41.38
31 to 40	8	27.59	3	10.34	11	37.93
41 to 50	2	6.90	2	6.90	4	13.79
> 50	1	3.45	0	0.00	1	3.45
Total	**19**	**65.52**	**10**	**34.48**	**29**	**100.00**

Table 2: Distribution of tubercular lymphadenitis cases as per cytological pattern

Cytological Pattern	Total	Percent
Caseous necrosis (CN)	5	17.24
Epithelioid cell granuloma (ECG)	5	17.24
Caseous necrosis and epithelioid cell granuloma (CN-ECG)	19	65.51
Total	29	100

Table 3: Distribution of patients with tubercular lymphadenitis according to AFB findings

AFB Grades	Distribution (n=29)	
	Number	Percentage
+ (1+)	4	13.79
++ (2+)	21	72.42
+++ (3+)	4	13.79
Total	**29**	**100.00**

Table 4: Correlation of cytological patterns of tubercular lymphadenitis with their AFB grades

Cytological pattern	+ (1+) (n=4)		++ (2+) (n=21)		+++ 3(+) (n=4)	
	No	%	No	%	No	%
CN (n=5)	0	0	2	10.50	3	75.00
ECN (n=5)	3	75.00	2	10.50	0	0
CN with ECN (n=19)	1	25.00	17	79.00	1	25.00
Total	**4**	**100**	**21**	**100**	**4**	**100**

Discussion

In this study tubercular lymphadenitis was noted as second most common pattern in 38.67% patients. Among them 65.52% were males and 34.48% were females. Overall, 41.38% cases had age between 21 to 30 years and 37.93% were aged between 31 to 40 years and similar pattern of age was noted among females (17.24% and 10.34% respectively) whereas among males 27.59% were between 31 to 40 years and 24.14% were aged between 21 to 30 years.

Similar findings were noted in a study [6] from South India. Tuberculous lymphadenitis was the second most common pattern [96 cases (41.55%)]. However, it was seen mainly in fourth decade constituting 57 cases (59.37%) and was seen predominantly in males with M: F ratio of 7.7:1. Other studies from Mangalore (50%) [7], Chadigarh (32%) [8], and Malaysia (53.84%) [9] also observed tuberculous lymphadenitis as a common lymph node

lesion. However studies conducted in California (17%) [10] and in Europe (15%) [11] and (22%) [12] demonstrated lower number of cases in comparison with present study.

Diagnostic difficulties which were initially in the area of differentiating tuberculosis from reactive changes which were later remedied by ensuring that sufficient material for routine staining for acid fast bacilli was available in every case. Therefore, routine staining for acid fast bacilli on every lymph node aspirate from HIV positive patients is recommended [12].

In this study out of 75 cases, 29 (38.66%) had tubercular lymphadenitis. Based on AFB staining pattern proposed by in a Indian study [13], most of the patients (72.42%) had grade ++ (2+) and 13.79% each had grade + (1+) and +++ (3+). Only those cases in which smear were positive for AFB were diagnosed as tuberculous lymphadenitis. Similar criterion was considered another Indian study [8]. Similar findings were reported in a study [6] from South India where Grade 2+ was the predominant pattern with (60.4%). In contrast, grade 1+ was predominant pattern observed in an another Indian study [13]. This difference in staining pattern could be probably due to the compromised immunity of patients as the former study included lymph node aspirates from both non-HIV individuals and HIV positive individuals.

In the present study chronic granulomatous lymphadenitis was noted in 8%. Among them, 83.33% were males and 16.67% were females. Overall, 33.33% each casewas aged between 21 to 30 and 31 to 40 years and similar pattern of age was noted among males (33.33% each). Among females 16.67% had age between 41 to 50 years.

A study [6] from south India reported 7.3% cases with granuloma but smears were AFB negative. These were called as non-specific chronic granulomatous lymphadenitis as no specific etiology could be determined. They were mainly seen in fourth decade [nine cases (52.94%)] with male preponderance [M:F = 1.8:1].

Conclusion

It is a valuable tool for identification of opportunistic infections, neoplastic lesions and non-neoplastic lesions.

References

1. Ravigilone MC, SniderDE, Kochi A. Global epidemiology of Tuberculosis: Morbidity and Mortality of Worldwide Epidemic. JAMA 1995; 273(3):220-6.
2. Jones BE, Young SM, Antoniskis D. Relationship of the manifestations of tuberculosis to CD4 cell counts in patients with human immunodeficiency virus infection. Am Rev Respir Dis 1993; 148(5):1292-7.
3. Havlir DV, Barnes PF. Tuberculosis in Patients with Human Immuno- deficiency Virus Infection. New Engl J Med 1999; 340(5):367-73.
4. Whalen C, Horsburgh, CR, Hom D, Lahart C, Simberkoff M, Ellner J. Accelerated course of human immunodeficiency virus infection after tuberculosis. Am J RespirCrit Care 1995; 151(1):129-35.
5. Whalen C, Horsburgh CR, Hom D, Lahart C, Simberkoff M, Ellner J. Site of disease and opportunistic infection predict survival in HIV-associated tuberculosis. AIDS 1997; 11(4):455-60.
6. Kumarguru, Kulkarni MH, Kamakeri NS. FNAC of lymph nodes in HIV positive patients. Scientific Medicine 2009; 1(2):4-12.
7. Shenoy R, Kapadia SN, Pai KP, Kini H, Mallya S, Khadilkar UN, et al. Fine needle aspiration diagnosis in HIV- related lymphadenopathy in Mangalore, India. Actacytol 2002; 46:35-9.
8. Saikia UN, Dev P, Jindal B, Saikia B. Fine needle aspiration cytology in lymphadenopathy of HIV-positive cases. ActaCytol 2001; 45:589-92.
9. Jayaram G, Chew MT. Fine needle aspiration cytology of lymph nodes in HIV – infected individuals. ActaCyol 2000; 44(6):960-6.
10. Bottles K, McPhaul LW, Volberding P. Fine needle aspiration biopsy of patients with acquired immunodeficiency syndrome (AIDS): experience in an outpatient clinic. Ann Int Med 1988; 108:42-5.
11. Reid AJC, Miller RF, Kocjan GL. Diagnostic utility of fine needle aspiration (FNA) cytology in HIV-infected patients with lymphadenopathy. Cytopathology 1998; 9:230-9.
12. Martin-Bates E, Tanner A, Suvarna SK, Glazer G, Coleman DV. Use of fine needle aspiration cytology for investigating lymphadenopathy in HIV positive patients. J clinPathol 1993; 46:564-6.
13. Kumar S, Ferns S, Sujatha S, Jatiya L. Acid – fast staining patterns and their correlation with HIV positivity. Actacytol. 2005; 49:111- 2.