Cytological Evaluation of Lymphadenopathy in HIV Patients

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Research Article

Abstract: Cytological study was carried out in 44 HIV positive lymphadenopathy cases by FNAC technique using 23 or 24 gauge needle. Cytological findings were co related with the CD4 counts done by the BD FACSCount system [(31)]. out of the total 44 cases 28 (63.6%) were males and 16 (36.3%) were females. Most of the males were affected in the 4th decade and females in 3rd decade of life. Male to female ratio was 1.7:1. Predominantly cervical group of lymph nodes 36 (81.8%) were enlarged followed by supraclavicular 4 (9%) and axillary 3 (6.8%) group of lymph nodes.Commonest cytodiagnosis offered was tuberculous lymphadenitis 20 (45.4%), followed by reactive lymphadenitis 13 (29.5%). The cytodiagnosis of chronic granulomatous lymphadenitis was give given in 8 (18.1%) and acute suppurative lymphadenitis in 3 (6.8%) cases.

Introduction

Acquired immunodeficiency syndrome (AIDS) is known to be caused by a lymphotropic retro-virus ie.Human immunodeficiency virus (HIV), first described by French investigators and later by investigators in United States. AIDS was first recognized in 1981 [(22)]. While HIV can infect many tissues, there are two major targets of HIV infections: immune system and central nervous system. Profound immunodeficiency, primarily affecting the cell mediated immunity is hallmark of AIDS [(1)]. This results chiefly from infection of and a severe loss of CD4 T cells as well as impairment in function of surviving T cells. HIV enters the body through mucosal tissues and blood and first infects T cells and dentritic cells and macrophages. The infection becomes established in lymphoid tissues, active viral replication is associated with more infection of cells and progression to AIDS. AIDS is a fatal illness that breaks down the body's immunity and leaves the victim vulnerable to life-threatening opportunistic infections, neurological disorders or unusual malignancy [(1)]. Lymphoid tissue is a favorite target for the initial viral infection, subsequent opportunist infections and Human Immunodeficiency Virus (HIV) associate neoplasm [(14)]. The incidence of HIV infection is increasing in Asia, particularly in Indian subcontinent. In developing countries like India with a huge population and socioeconomic constraint there is a great need for a simple investigative technique for HIV infected lymphadenopathy cases. Lymphadenopathy is one of the earliest manifestations of HIV [(25)]. This may be due to presence and effect of HIV. Lymphadenopathy may also be a manifestation of opportunist infection, lymphoid malignancy developing in an immunodeficient individual [(22)]. The role of fine needle aspiration cytology (FNAC) in evaluation of lymphadenopathies is well known. FNAC can serve as alternative method and may be practiced for the diagnosis of opportunist infection in HIV/ AIDS, eg: - tuberculosis, histoplasmosis, toxoplasmosis and malignant condition such as Kaposi's sarcoma and lymphoma [(22)]. FNAC has become the primary investigative procedure for mass lesions on HIV-positive patients, particularly in the assessment of lymphadenopathy. The procedure is rapid, easily performed and in many cases obviates excision while guiding subsequent therapy or observation. This study was performed to evaluate the role of FNAC as a cytological investigative tool in the diagnosis of various lesions in HIV lymphadenopathy.

Material and Method

This study was carried out in Dr Panjabrao Deshmukh Memorial Medical College and Hospital Amravati, over a period of one and half years. Total 44 cases of HIV lymphadenopathy patients were participated in the study after having signed theInformed Consent Form. Diagnosis of HIV was done by enzyme linked immunosorbant assay (ELISA) test. Followed by the CD4 counts by BD FACSCount system[(31)] in HIV positive patients. FNAC procedure was performed as an OPD procedure in cytology OPD of pathology department. The swelling was localized by careful palpation and site was cleaned with spirit and fixed in favorable position with one hand, and 22 or 23 gauge needle was attached to 10cc syringe fitted on to comeco syringe pistol and FNAC was done. Smears were immediately fixed in 95% ethyl alcohol for PAP staining. Air dried smears were kept for MGG, AFB and special stain for fungi PAS and Methinamine Silver.

Observations

Table 1: Distribution of Age and Sex in HIV patients in the study

	Males	Females	Total	Percentage(%)
1-10	01	01	02	4.5
11-20	01	01	02	4.5
21-30	07	09	16	36.3
31-40	16	04	20	45.4
41-50	03	00	03	6.8
51-60	00	01	01	2.2
Total	28	16	44	100

Total 44 HIV positive patients were included in this study, out of which 28 (63.6%) are males and 16 (36.3%) are females. This shows that there is predominance of males over the females. Male to female ratio is 1.7:1. Also it is evident that majority of male patients are between 31 to 40 years of age, whereas majority of females are in between 21 to 30 years of age. Number of cases at the extremes of age is very less.

Table 2: Classification of the HIV positive cases according to the site involved

Site involved	No. of patients	Percentage (%)
Cervical Lymph nodes	36	81.8
Axillary Lymph nodes	03	6.8
Supraclavicular Lymph nodes	04	9
Generalized	01	2.2
Total	44	100

From the above table it is evident that most common site of HIV lymphadenopathy is cervical lymph node 36 (81.8%), followed by supraclavicular 4 (9%) followed by axillary lymph node 3 (6.8%).

Table 3: Distribution of Cases According to Cytological Diagnosis in HIV Positive Patients in The Study.

Diagnosis	No.of patients	Percentage (%)
Mycobacterial Infection	20	45.4
Reactive lymphadenitis	13	29.5
Nonspecific chronic granulomatous lymphadenitis	08	18.1
Acute suppurative lymphadenitis	03	6.81
Total	44	100

The most common lesion found was mycobacterial infection 20 (45.4%), followed by reactive lymphadenitis 13 (29.5%). Non-specific chronic granulomatous lymphadenitis in 8(18.1%) and 3(6.81%) cases of acute suppurative lymphadenitis. The diagnosis of tuberculous lymphadenitis was considered only when smear for Acid Fast Bacilli (AFB) were positive.

Table 4: Cytological Patterns of Tubercular Lymphadenitis in HIV Patients

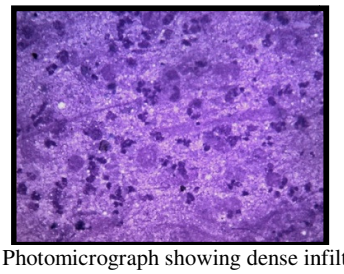
Cytological pattern	No.of cases	Percentage (%)
Smears showing only caseous necrosis	07	35
Smears showing caseous necrosis with epithelioid cells	08	40
Smears showing only epithelioid cells	03	15
Suppurative features	02	10

Tubercular infection was the most common opportunist infection. These cases were grouped into four categories in which predominant pattern was smears showing caseous necrosis with epithelioid cells in 8 (40%) cases. Within this group we found giant cell formation in two cases. Followed by smears showing only caseous necrosis in 7 (35%) cases. 3 (15%) cases showed only epitheloid cells and 2 (10%) cases shows suppurative changes.

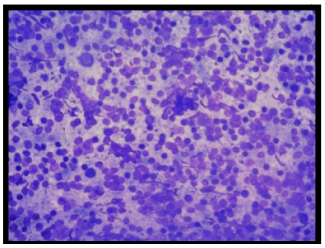
Table 5: Comparison of CD4 Cell Count with Different Cytological Diagnosis

CD4 count (cells/µL)	Tubercular	Reactive	Chronic grannulomatous	Acute suppurative
>500	00	08	03	00
200-499	11	05	03	02
<200	09	00	02	01

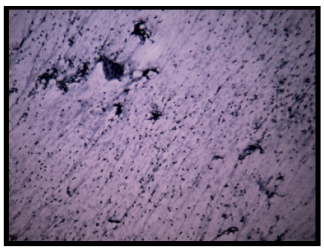
CD4 count more than 500 cells/ µL was seen in 8 (18.1%) cases of reactive lymphadenitis and 3 (6.8%) cases of chronic granulomatous lymphadenitis. Patients with tubercular infection had CD4 count between 200- 499 cells/ µL in 11 (25%) cases and less than 200 in 9 (20.4%) cases. In chronic granulomatous lymphadenitis 3 (6.8%) cases had CD4 count more than 500 cells/ µL, 3 (6.81%) cases had CD4 count in between 200 to 499 cells/ µL and 2 (4.5%) cases had CD4 count less than 200 cells/ µL. In acute suppurative lymphadenitis 2 (4.5%) cases had CD4 count in between 200 to 499 cells/ µL, and 1 (2.2%) case had CD4 count less than 200 cells/ µL.



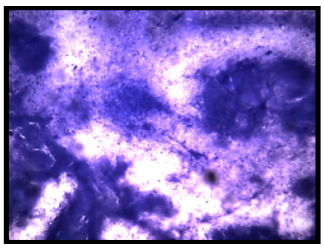
Photomicrograph showing dense infiltration of neutrophils, this case was positive for AFB (HP)Tubercular lymphadenitis with suppurative features. (MGG)



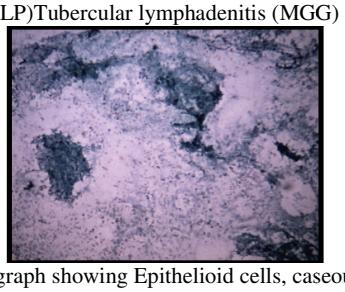
Photomicrograph showing mixed population of lymphoid cells, centroblast,centrocytes and small and large lymphocytes. (HP) Reactive lymphadenitis. (MGG)



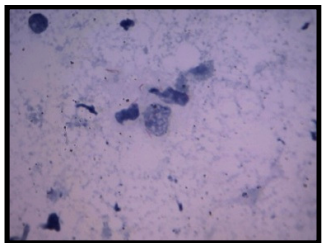
Photomicrograph showing giant cell formation. (LP)Tubercular lymphadenitis. (PAP)



Photomicrograph showing caseous necrosis with epithelioid (LP)Tubercular lymphadenitis (MGG)



Photomicrograph showing Epithelioid cells, caseous necrosis with neutrophils. (LP) Tubercular lymphadenitis with suppurative features. (PAP}



Photomicrograph showing tubercle bacilli. (OI) Tubercular lymphadenitis. (ZN)

Discussion

In present study FNAC was performed on 44 HIV positive patients, who presented with lymphadenopathy. Out of the 44 patients, 28 (63.6%) were males and 16 (36.3%) were females with male to female ratio of 1.7:1. Out of the 44 patients 2 (4.5%) patients were between 1-10 years. 2 (4.5%) were between 11-20 years. 16 (36.3%) were between 21-30 years. 20 (45.4%) patients were in between 31 -40 years. 3 (6.8%) patients were in between 41-50 years, and 1 (2.2%) patient was in between 51-60 years. Majority of males were affected in 31-40 years of age and majority of females affected in 21-30 years of age. Findings of our study correlate well with the Shenoy et al [13], Vanisiri et al [22] and Rajasekaran et al [11]. Out of 44 cases in 36 (81.8%) patients cervical group of lymph nodes were involved, in 4 (9%) cases supraclavicular group of lymph nodes were involved, in 3 (6.8%) cases axillary group of lymph nodes, and in 1 (2.2%) case multiple sites were involved. Finding of our study correlate well with the studies of Bates et al[6]. ,Jayaram et al[10]. and Kumarguru et al[25]. Tubercular lymphadenitis was the most common finding in the present study (45.4%), Reactive lymphadenitis was second most common diagnosis in present study (29.5%). Reactive lymphadenitis and Mycobacteria infection are the 2 most findings in the almost all study. In study conducted by Bates et al **[6]**, Reid et al **[8]** and Satyanarayna et al **[14]** most common cytology finding is reactive lymphadenitis while in study conducted by Shenoy et al **[13]**,Vanisri et al **[22]** and in present study most common finding is tuberculosis. AFB positivity was taken as criteria for diagnosis of tuberculosis. Other studies Shenoy et al **[13]** noted (48.2%) cases of tuberculosis while Vanisri et al **[22]** noted highest (58.3%) of tuberculosis cases, Satyanarayana et al **[14]** also noted 34.2% cases of tuberculosis while Bates at el**[6]** noted 22% and Reid et al [8] 15% cases of tuberculosis. This observation indicates that in Indian population tuberculosis is more common in HIV lymphadenopathy than in Western Countries. Reactive lymphadenitis was second most common diagnosis in present study (29.5%), it was identified by proliferation of polymorphic lymphocytic population with centroblasts, centrocytes immunoblasts, plasma cells, small lymphocytes and pale histiocytes in variable proportions with no any other specific findings.

Neoplastic lesions were not found in our study .In other studies Bates at el[6] noted 4%, Reid et al [8] 9% and Shenoy et al [13] 8.9% cases of lymphoma, while Satyanarayana et al [14] noted 2.6% and Vanisri et al [22] 2.7% cases of lymphoma.Kaposi sarcoma was not found in any case in the present study as well as in other studies conducted by Indian authors but in western countries higher number of cases of Kaposi sarcoma was observed. No opportunistic infection other than Mycobacteria identified in the present study. Shenoy et al [13] and Vanirsi et al [22] also did not found any other opportunistic infection. Bates et al [6] Noted one case of *Histoplasma* and one case of *Cryptococcus*. Satyanarayan et al [14] noted one case of *Cryptococcus* and one case of *Rhodotorula*.

Table 6: Table Showing Comparison of Results of FNAC Findings in HIV Patients in Different Studies

Diagnosis	Bates et al [6] (1993) n= 27	Reid et al [8] (1998) n= 65	Shenoy et al [13] (2002) n=56	Satyanarayana et al[14](2002) n= 196	Vanisiri et al[22]. (2008) n= 36	Present study n= 44
Mycobacterial infection	22%	15%	48.2%	34.2%	58.3 %	45.4%
Reactive lymphadenitis	41%	51%	35.7%	42.3%	36.1%	29.5%
Lymphoma	4%	9%	8.9 %	2.6%	2.7%	00
Kaposi sarcoma	15%	2%	00	00	00	00
Others	18%	23%	7.2%	23.5%	2.7%	24.9%

In all the patients CD4 count was compared with cytological pattern. Out of total 13 reactive lymphadenitis cases CD4 count was >500/ µL with mean of 643.3 cells/µ L in 8 (61.5%) of cases, and in between 200-499 with the mean of 300.2 cells/u L in 5(38.4%) of cases. The reactive lymphadenitis cases showed highest mean CD4 counts.Out of total 20 tubercular lymphadenitis 11 (55%) cases of showed CD4 count between 200-499/ µL with the mean count 225.3 cells/µL. In 9 (45%) of cases of tuberculosis CD4 count was <200/µL with mean count of 166.8 cells/µL. Out of total 8 cases of chronic granulomatous lymphadenitis 3 (37.5%) showed CD4 count >500/ µL with the mean value of 536 cells/ µL. 3 (37.5%) cases showed count between 200-499 with the mean of 343 cells/uL and 2 (25%) had CD4 count < 200/ µL with the mean of 71 cells/ µL.

Conclusion

1) FNAC is relatively inexpensive and valuable tool for identification of opportunistic infections, neoplastic lesions and non-neoplastic lesions.
2) It may spare patients lymph node excision and enable immediate treatment of specific infection. This procedure is readily repeatable and can be used for follow up during and after treatment.
3) Tuberculosis is major opportunistic infection which could be detected in both asymptomatic and symptomatic individuals and even with the tiny lymph nodes. Z. N. stain should always be done. AFB should be looked for even when cytological picture does not suggest tuberculosis.
4) Lymph node cytology is useful for segregating lymphadenopathy cases that need further evaluation. Non-specific chronic granulomatous lymphadenitis needs biopsy for etiological workup. Neoplastic lesions are other such lesion that needs biopsy.
5) Correlation of lesions with CD4 T lymphocyte counts provides information about the immune status and stage of the disease.
6) Thus FNAC is a primary, easy and effective diagnostic modality for HIV lymphadenopathy patients. It helps in identifying majority of the reactive and neoplastic lesions and opportunistic infections and guide for the subsequent management of the patient. FNAC findings in the HIV lymphadenopathy are noticeably different in India in comparison to the Western Countries.

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