

Original Research Article

Posterior segment manifestations in human immunodeficiency virus/acquired immunodeficiency syndrome patients in rural population of central india

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ABSTRACT

Background: Ocular manifestations of HIV infections are common in the developing countries with lacking data in rural areas. The aim of study was to assess the prevalence of ophthalmic manifestations among HIV infected individuals in rural population and to find the relationship between CD4 count and ocular manifestations among these individuals.

Methods: Authors have included 400 HIV patients of age more than 15 years that were registered in ART center of our institute. Ocular examination was done with slit lamp biomicroscope and indirect ophthalmoscope. Blood sample was sent for CD4 count analysis.

Results: The mean age of patients were 31.9±9.3 years, the ocular manifestations were more commonly found in the age group 25-35 years. 51 % were males and 49% were females. Most common mode of transmission was heterosexual contact (51%). 55 % patients had CD4 count >150 cell/cumm. Cotton wool spots (36%) and intra-retinal haemorrhages (32%) was most common posterior segment findings followed by ocular toxoplasmosis (13%), CMV retinitis (10%), acute retinal necrosis (3 %).

Conclusions: The prevalence of ocular manifestations in HIV patients is high and is a burden for our society, authors recommend screening of all the HIV patients to detect any vision threatening ocular lesions at the earliest.

Keywords: Cotton wool spots, HIV retinopathy, Intra-retinal haemorrhage

INTRODUCTION

Since the original description of the acquired immunodeficiency syndrome (AIDS) as a new disease characterized by opportunistic infections and unusual neoplasm in young adults in 1981, AIDS has become a worldwide epidemic.

According to national AIDS control organization, HIV prevalence in India was 0.26% in 2015.¹ Routes of HIV

transmission include homosexual and heterosexual contact, intravenous drug users, blood transfusions, clotting factors and pregnancy. Among all these heterosexual contacts is found to be the most common.^{2,3}

There are two types of HIV i.e. type 1 and type 2. Type 1 is more common. The subtypes of HIV-1 which are more prevalent in India are A, B and C. CD4+ helper T cells of human lymphocyte system get predominantly affected in

HIV infected patients. Normal CD4+ counts are between 300 to 1000 cells/cu. mm.

Currently, the majority of patients infected with HIV are asymptomatic. Once the CD4+T cell count has fallen sufficiently (generally, <500 cells/cumm) that the immune system shows some evidence of impairment, patients begin to develop symptoms, such as thrush. Early in the AIDS epidemic, patients with these symptoms but without fully developed AIDS were classified as having the AIDS-related complex (ARC). AIDS occurs when the immune system is sufficiently impaired that the patient develops opportunistic infections or unusual neoplasm (generally, CD4+ T cells <200 cells/cumm). Posterior segment manifestations are more common in HIV infected persons than other manifestations.⁴ The spectrum of manifestations varies demographically with opportunistic infections related manifestations common in developed countries than in developing countries.

Various posterior segment manifestations are HIV retinopathy (micro vasculopathy), opportunistic infections (cytomegalovirus retinitis and necrotizing herpetic retinitis), toxoplasmosis, choroiditis that may be tubercular, cryptococcal choroiditis, pneumocystis choroiditis or malignancy induced choroiditis.⁴

METHODS

The present study was a cross sectional study conducted on the 400 HIV/AIDS patients. All patients of age ≥ 15 years registered in the anti-retroviral therapy (ART) center of our institute irrespective of whether the patient is on ART or pre-ART therapy and ready to give consent were included in the study. The exclusion criteria were patients suffering from diabetes and hypertension, of age <15 years and not ready to give consent. The study was done after obtaining the institutional ethical committee's clearance. The study was conducted for the period of one and half years. The ocular examination of all the patients

were done that includes visual acuity assessment using Snellen's chart. Fundoscopy was performed after dilating the pupil with 0.5% tropicamide eye drop with direct ophthalmoscope (Heine Germany B200S), indirect ophthalmoscope (Heine Germany W500) and +90D bio microscopy (Carl Zeiss Meditec AG SL115 Classic Jena Germany) and fundus photographs were taken by using standard 45 degree fundus camera (Carl Zeiss Meditec AG FF 450 Plus IR Jena Germany) in the presence of posterior segment findings.

Statistical analysis

The analysis was done by using the SPSS +24.0 computer package for statistics. The variables of interest in present study were age, gender, mode of infection, CD4 count and posterior segment findings. The results were calculated in terms of proportions, mean, percentage. Association between the subjects were calculated using Pearson's chi-square test with 95% confidence interval.

RESULTS

The mean age of the patients was 31.9 ± 9.3 years (range 15 years-65 years). Table 1 shows that there was no difference in ocular manifestation among the study patients of different age groups ($P=0.874$).

There were 203(51%) male and 197 (49%) female in the study population ($n=400$) with male: female ratio 1:1 and the distribution of ocular manifestations among both the gender was almost similar. ($P=0.136$). So, there was no association between ocular manifestation with gender of the patient (Table 2).

Heterosexual contact was the most common mode of infection among the patients and responsible for 51% spread of infection. Remaining 49% of infections spread by the blood transfusion and IV drug abuse (Table 3).

Table 1: Distribution of age among study patients.

Age	Frequency (n=400)	Percentage	Patients with ocular manifestation	P value
15-25years	120	30	32 (27%)	P=0.874 (Pearson's chi square test >0.05)
25-35years	157	39	46 (29%)	
35-45years	88	22	25 (28%)	
>45years	35	9	8 (23%)	

Table 2: Gender of HIV patients with ocular manifestations (n=111).

Gender	Patients with ocular manifestations Present	P value
Female	48 (24%)	P=0.136 Pearson's chi square test >0.05
Male	63 (31%)	

Table 3: Mode of infection in patients of HIV with ocular manifestations.

Mode of infection	Frequency (n=400)	Percentage	Patients with ocular manifestation	P value
Blood transfusion	143	36	49 (34%)	P=0.015 Pearson's chi square test <0.05
Heterosexual contact	205	51	55 (27%)	
Iv drug abuser	52	13	7 (14%)	

But in patients with ocular manifestations, blood transfusion was the most common mode of infection accounting for 34% of the patients followed by

heterosexual contact (27%) and difference was statistically significant (P=0.015).

Table 4: Distribution of CD4 count among study patients with ocular manifestations.

CD4 count (cell/cubic millimeter)	Frequency (n=400)	(%)	Patients with ocular manifestations	P value
<50	26	7	26 (100%)	P<0.001 Pearson's Chi square test <0.05
51-100	12	3	12 (100%)	
101-150	141	35	70 (50%)	
>150	221	55	3 (1%)	

The mean CD4 counts of the patients were 158±53 cell/cubic millimeter (range 10-325 cell/cubic millimeter). Most of the patients had CD4 count >150. (Table 4) shows that all the patients with CD4 count <100 cells/cu mm had ocular manifestations which was statistically significant (P <0.001).

followed by ocular toxoplasmosis (14%), CMV retinitis (11%) (Figure 2), acute retinal necrosis (3%).



Figure1: HIV microangiopathy showing various cotton wool spots.

Most common posterior segment manifestations among the HIV patients was HIV retinopathy (72%) including cotton wool spots and intraretinal hemorrhages (Figure1)

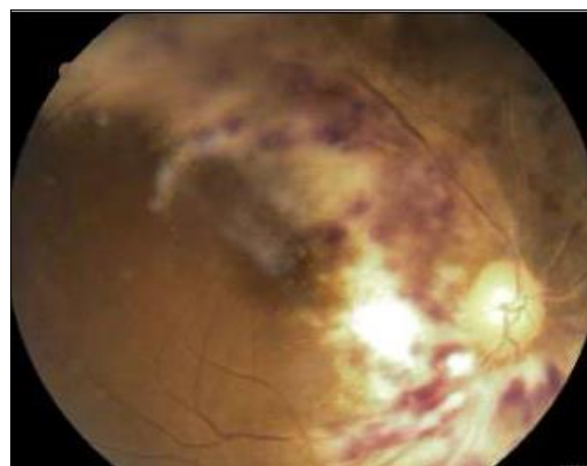


Figure 2: Established CMV retinitis: right eye.

Authors studied the CD4 Counts of patients with posterior segment manifestations. Most the patients with CD4 count <150 cells/cubic millimeter had posterior segment manifestations. The CD4 count of posterior segment disease is shown (Table 5).

HIV retinopathy was the most common manifestation in CD4 <50 cells/cumm (81%). Second most common manifestation was CMV Retinitis (12%).

Table 5: CD4 counts of HIV patients with posterior segment finding.

Patients with posterior segment disease (n=94)					
CD4 count	CMV retinitis	Cotton wool spots	Intraretinal haemorrhage	Ocular toxoplasmosis	Acute retinal necrosis
<50	3 (12%)	12 (46%)	9 (35%)	1 (4%)	1 (4%)
51-100	1 (8%)	5 (42%)	3 (25%)	3 (25%)	0
101-150	5 (4%)	18 (13%)	20 (14%)	8 (6%)	2 (1%)
>150	1(0.4%)	1 (0.4%)	0	1 (0.4%)	0

DISCUSSION

The mean age of the patients in the study was 31.9±9.3 years (range 15-65 years). Most of the patients in the study were between 15- 35 years. Biswas J et al, Sharma M et al, also concluded in their study that most of the patients were young (20-40 years) and most of them had ocular manifestations but the difference in ocular manifestation in the various age groups was not statistically significant.^{5,6} Gogri PY et al, in their study had concluded that the mean age of patients as 38.7±9.1 years which is similar to the present study.⁷

Many studies including Indian studies have concluded that heterosexual contact to be the most common mode of infection in HIV infection.⁷⁻¹⁰ In present study half of the total patients had contacted HIV infection by heterosexual contact (51%). Remaining 49% had infection through other mode of infections. But ocular manifestations were most common in patients with blood transfusion as a mode of infection. The difference was statistically significant (p=0.015).

The mean CD4 count in the present study was 153±53 cells/cubic millimeter (range 10-325). 55% of the patients had count >150 cells/cubic millimeter but patients with CD4 count <150 cells/cubic millimeter had most of the ocular manifestations. Almost all the patients with count <100 cells/cubic millimeter had ocular manifestations and was statistically significant (P<0.001).

In present study HIV retinopathy was found to be the most common posterior segment finding accounting for 72%. Most of the studies including Indian studies found HIV Retinopathy to be the most common manifestation.⁷⁻¹⁰ Other manifestations include CMV retinitis, ocular toxoplasmosis and acute retinal necrosis accounting for rest 28% of the findings. HIV retinopathy was seen in 21 (81%) of the patients with CD4 count <50 cells/cubic millimeter, 8 (67%) with CD4 count 51-100 cells/cubic millimeter and 38 (27%) patients with CD4 count between 101-150 cells/cubic millimeter (P<0.001). This was earlier proved by Sahu DK et al, Gogri PY et al, Sharma RL et al, Nihijima T et al, Sharma M et al, whereas Kumar P et al, had found CMV retinitis as most common manifestation.⁶⁻¹¹ CMV retinitis was seen in 3

(12%) of patients with CD4 count <50 cells/cubic millimeter, 1 (8%) with CD4 count 51-100 cells/cubic millimeter, 5 (4%) with CD4 count 101-150 cells/cubic millimeter. (P=0.13). Nihijima T et al, had found 24 (2%) patients of posterior segment manifestations with CMV retinitis.¹⁰ Ocular toxoplasmosis was seen in 1 (4%) patient with CD count <50 cells/cubic millimeter, 3 (25%) patients with CD4 count 51-100 cells/cubic millimeter, 8 (6%) patients with CD4 count 101-150 cells/cubic millimeter (P=0.786).

CONCLUSION

An HIV infection /AIDS patient is one of the major problems in the present day. It causes immunocompromised state that is responsible for most of the systemic and ocular manifestations. HIV Retinopathy was the most common posterior segment finding and was also associated with CD4 count<50 cells/cubic millimeter. As per present study, we recommend routine ocular examination to be done in all the HIV/AIDS patients to detect and treat vision-threatening ocular lesions at the earliest especially those with CD4 <100 cells/millimeter.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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