Original Article

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Ophthalmic Manifestations in Human Immunodeficiency Virus Patients at Presentation in a Tertiary Care Hospital

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Abstract

Background: Numerous ophthalmic manifestations of human immunodeficiency virus (HIV) infection may involve the anterior or posterior segment of the eye. Anterior segment findings include a variety of external infections and tumors of the periocular tissues. Posterior segment changes include an HIV-associated retinopathy and a number of opportunistic infections of the retina and choroid.

Materials and Methods: Observational cross-sectional study done over a period of 6-month at a Tertiary Care Hospital. A total of 246 HIV positive patients were screened for ophthalmic manifestations. CD4 counts correlated with anterior and posterior segment lesions. Patients already on treatment for eye manifestations were excluded.

Results: Out of the 246 patients, 127 (51.62%) were in the 4th decade of life. About 28 patients (88.60%) had ophthalmic manifestations out of the total 246 patients. Visual acuity was better or equal to 6/12 in 42.85% of patients (12). Posterior segment lesions were found in 18 patients (64.3%), anterior segment lesions in 7 (25%), and both anterior and posterior segment lesions in 3 patients (10.7%). About 50% of patients had CD4 count >500/cumm, ophthalmic manifestations were present at all CD4 counts. 6 patients with anterior segment lesions had CD4 count >200 with only 1 patient having <200. Of the 21 patients with posterior segment findings, 18 had CD4 count <500. All 3 patients with anterior and posterior segment findings had CD4 count <100. HIV retinopathy was present in all ranges of CD4 count. 3 patients with cytomegalovirus (CMV) retinitis had CD4 count <200. Opportunistic infections were predominant in CD4 count in the range of 200.

Conclusion: HIV retinopathy, CMV retinitis, blepharitis, anterior uveitis, and viral keratitis are the ophthalmic manifestations at presentation in order of prevalence in this study. Low CD4 count is a good predictor for CMV retinitis and posterior segment manifestations in patients with anterior segment lesions.

Key words: CD4 count, Cytomegalovirus retinitis, Human immunodeficiency virus retinopathy, Ophthalmic manifestations, Opportunistic infections

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) is an infectious disease caused by a retrovirus, the human immunodeficiency virus (HIV). This syndrome is characterized by a gradual decrease in circulating CD4+ T-lymphocytes and subsequent development of various opportunistic infections and neoplasia.

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The World Health Organization Report in 2014 estimates 35 million people including 3.2 million children have been infected with HIV worldwide.[1] Overall, 58% of HIV patients show ophthalmic manifestations.[2] Among HIV-positive individuals, the lifetime cumulative risk for developing at least one abnormal ocular lesion ranges from 52% to 100% in various studies.[3]

The role of the ophthalmologist in the diagnosis of AIDS is becoming increasingly important. Not only does the eye reflect systemic disease but also ocular involvement

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may often precede systemic manifestations so that we can initiate treatment early. In the AIDS patients, the ophthalmologist has an opportunity to make not only a sight saving, but also a lifesaving diagnosis of disseminated opportunistic infections.

The aim of this study is to evaluate the various ophthalmic manifestations in proven HIV seropositive patients at a tertiary care center at presentation and to study the variations at different levels of immunosuppression with the aid of CD4 count.

MATERIALS AND METHODS

The present study was a hospital-based observational cross-sectional study carried out at the Department of Ophthalmology in a tertiary care hospital for a period of 6-month. Institutional Ethics Committee Approval was obtained. The hospital has an ART (antiretroviral therapy) center affiliated to National AIDS Control Organization and catering to surrounding villages in the region. Inclusion criteria: HIV seropositive patients at their first visit to Ophthalmology OP after diagnosis as a part of their routine screening. Patients already on treatment for eye manifestations were excluded. A total of 246 patients were included in the study. Informed consent was taken along with demographic data like age, sex and occupation. Visual acuity noted using Snellen's vision charts. Field examination, color vision, histopathological examination was done as required. Slit lamp examination with imaging was performed for anterior segment findings. Posterior segment examination was done with the help of +90D lens, direct and indirect ophthalmoscopy. Fundus photography, fundus fluorescein angiography, ultrasound examination were performed for relevant cases. Ancillary investigations, such as magnetic resonance imaging and infectious agent antibody titers, were obtained in cases wherever necessary. CD4 count was obtained in all cases.

RESULTS

Out of the 246 patients that were screened, 51.62% (127) were in their 4th decade. There were 162 males and 84 females in the study. Drivers (30.48%) predominated among males followed by laborers. Among females majority were house wives (76%).

At presentation, 28 patients showed ophthalmic manifestations and 218 patients were asymptomatic with no clinical findings (Chart 1). Among the 28 patients with ophthalmic manifestations, patients had vision as shown in Table 1.

Out of the 28 patients, anterior segment lesions were found in 7 patients, posterior segment lesions in 18 patients and both anterior and posterior segment findings were present in 3 patients.

Out of the 7 patients with anterior segment lesions, 5 patients had Herpes simplex virus keratitis, blepharitis, meibomitis, molluscum contagiosum, herpes zoster ophthalmicus, respectively, 2 patients were diagnosed to have anterior uveitis without any posterior segment findings. Out of the 18 patients with posterior segment lesions, 11 patients had HIV retinopathy, 3 patients had cytomegalovirus (CMV) retinitis, 4 patients had toxoplasmosis, optic neuritis, choroidal melanoma, choroiditis, respectively. 3 patients had both anterior segment and posterior segment lesions. CD4 counts of patients with opportunistic infections are as shown in Table 2 and Figures 1-4.

Table 1: BCVA in patients with ophthalmic manifestations in our study

BCVA in diseased eye	Number of patients *n*=28 (%)
≥6/12	12 (42.85)
6/18-6/60	8 (28.57)
5/60-3/60	5 (17.85)
2/60-1/60	2 (7.14)
<1/60	1 (3.57)

BCVA: Best corrected visual acuity

Table 2: CD4 count in patients with opportunistic infections

Opportunistic infections	CD4 count (mean)/cumm
CMV retinitis	108
Toxoplasmosis	158
HSV Keratitis	314.5
Herpes Zoster ophthalmicus	256
Molluscum contagiosum	250

HSV: Herpes simplex virus, CMV: Cytomegalovirus

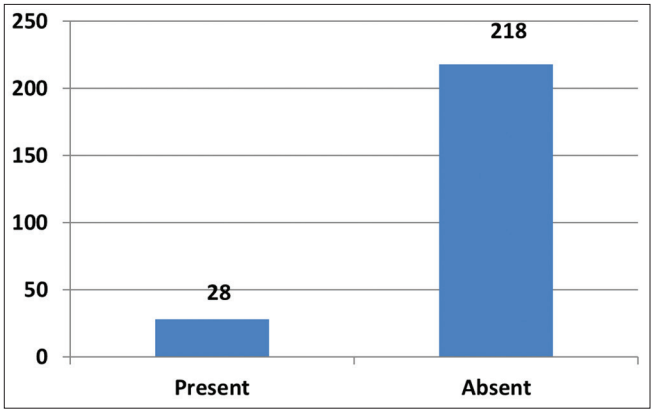

Chart 1: Number of patients with and without ophthalmic manifestations in the study

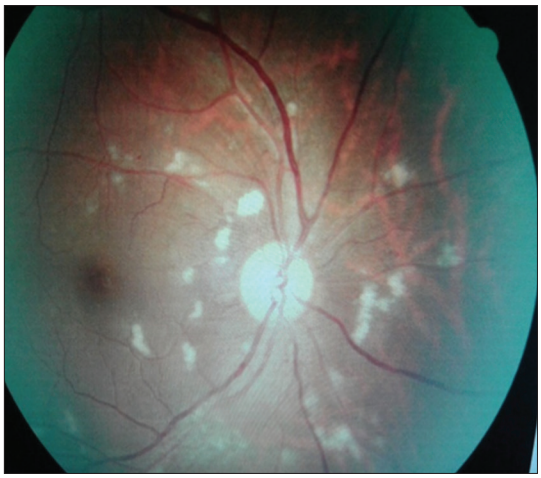

Figure 1: Fundus picture of right eye depicting features of human immunodeficiency virus retinopathy

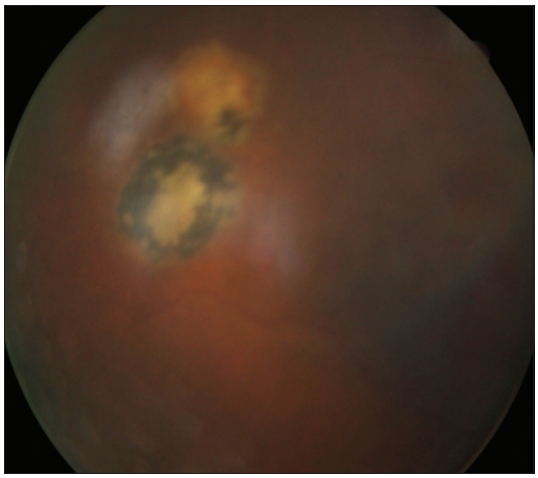

Figure 3: Fundus picture showing features of toxoplasmosis with pigmented retinochoroidal scar

Figure 2: Fundus picture showing non-pigmented choroidal melanoma

Figure 4: Fundus picture showing cytomegalovirus retinitis in the posterior pole surrounding the disc

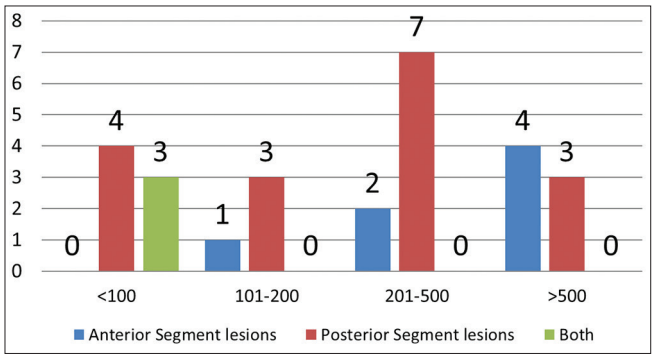

Chart 2: Comparison of 3 groups of patients at all CD4 counts

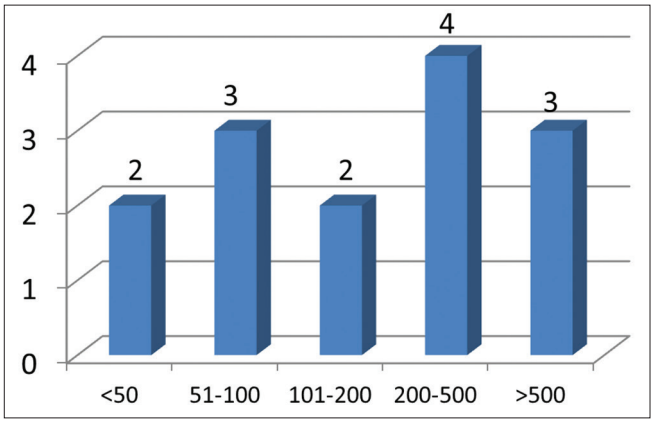

Chart 3: Depiction of relation of human immunodeficiency virus retinopathy with CD4 count

Out of the patients studied, 132 patients had CD4 count >500/cumm. Ophthalmic manifestations were present at all CD4 counts (Table 3).

The majority of anterior segment lesions were present at CD4 count>200. Of the 21 patients with posterior segment findings, 18 had CD4 count <500. All 3 patients with anterior and posterior segment findings had CD4 count <100 (Chart 2). HIV retinopathy is present in all ranges of CD4 count (Chart 3), 3 patients with CMV retinitis had CD4 count below 200 in this study (Chart 4).

Table 3: CD4 count in total patients studied and in those with findings

CD4 count	Over all	With ophthalmic manifestations
<100	18	7
101-200	27	5
201-500	69	9
>500	132	7

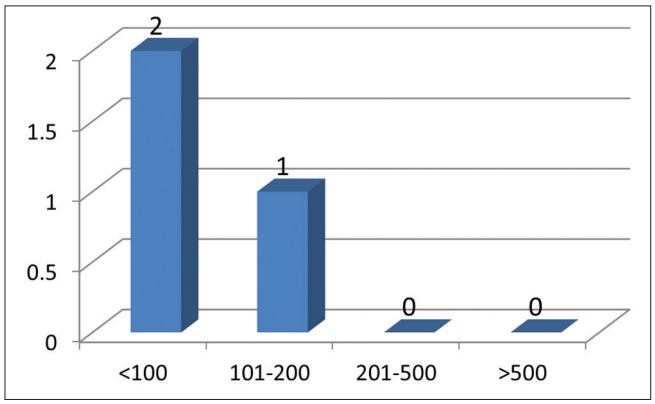

Chart 4: Depiction of relation of cytomegalovirus retinitis with CD4 count

DISCUSSION

Out of 246 patients screened, mean age group was 31-40 years correlating with Biswas *et al.*, study,[4] males predominated which correlates with national statistics of HIV population.[5]

About 28 patients were found to have ophthalmic manifestations. Among these 7 had anterior segment lesions,[6] 18 patients had posterior segment lesions,[4] 3 patients had both anterior and posterior segment lesions.

HIV retinopathy is the most common ophthalmic manifestation (50%).[3] There was no association between anterior segment lesions and CD4 count of the patients. Patients of anterior segment lesions who had CD4-count <100 cells/cumm also had concurrent posterior segment lesion. Posterior segment opportunistic infections showed association with low CD4-count. 11.4% of HIV patients had ophthalmic manifestations at presentation. Among the patients with ophthalmic manifestations, 43% had CD4 count <200/cumm. HIV retinopathy is the most common presentation and 50% of these patients had CD4 count <200/cumm. Incidence of posterior segment opportunistic infections such as CMV retinitis[7] and Toxoplasmosis[8] increases with low CD4 count. Early screening of HIV patients explains low prevalence of ophthalmic manifestations in our study.

CONCLUSION

HIV retinopathy, CMV retinitis, blepharitis, anterior uveitis, and viral keratitis are the ophthalmic manifestations at presentation in order of prevalence. Low CD4 count is a good predictor for CMV retinitis and posterior segment manifestations in patients with anterior segment lesions. There needs to be awareness of ocular involvement among HIV infected individuals and an increased emphasis on regular ophthalmic examination.

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