A STUDY OF OCULAR MANIFESTATIONS IN PATIENTS WITH HIV-AIDS INFECTION AND CORRELATION WITH CD4 COUNT

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ABSTRACT

BACKGROUND

The Human Immunodeficiency Virus (HIV) Acquired Immuno Deficiency Syndrome (AIDS) is one of the most feared infectious diseases of the late 20th century. The eye is an organ with wide spectrum of HIV-related manifestations involving the anterior and posterior segment of eye. Progression of disease causes decrease in CD4 count, which strongly associates with occurrence of different ocular manifestations. Increasing use of Antiretroviral Treatment (ART) is improving the survival of AIDS patients and changing the scenario of ocular manifestations.

MATERIALS AND METHODS

Prospective study was done from May 2015-April 2016 at Outpatient Department of Ophthalmology, KIMS, Hubli, patients visiting the ART Centre, KIMS Hospital, Hubli.

RESULTS

In this study, examined 760 patients to study the ocular manifestations of HIV/AIDS. The mean of all patients was 35 years. The youngest patient was 2years and the eldest patient was 73 years old. 280 patients were in the earning age group of 21 to 50 years.

CONCLUSION

We conclude from our study that ocular manifestations is more common in patients with CD4 count less than 300 and involvement of anterior segment is more than posterior segment involvement.

KEYWORDS

Ocular Complications, HIV/AIDS, HAART.

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BACKGROUND

Human Immunodeficiency Virus (HIV) infection and Acquired Immunodeficiency Syndrome (AIDS) is a global pandemic with cases reported from practically every country in the world. The recent World Health Organization (WHO) estimate of the total HIV burden in the world is 33.2 million (30.6-36.1 million).[1] India is categorised as a low prevalence nation, but a major concern is that in view of the large population size, a mere 0.1% increase in the prevalence rate would increase the numbers of patients living with HIV infection by over half a million.[2]

HIV causes a wide spectrum of diseases and it is mainly a multisystem disorder, but the ophthalmic diseases does affect 70-80% of the patients with HIV infection sometime during the natural history of their infection. Various studies have stated that 40-45% of the HIV infected patients do have one or the other ophthalmic manifestations when they are examined by an ophthalmologist. The spectrum of the HIV associated ophthalmic disease is very broad and it ranges from the adnexal disorders to posterior segment disorders, including the optic nerve and the optic tract. These ocular manifestations can be the presenting signs of a systemic infection in an otherwise asymptomatic individual. The sequelae of HIV infection increases as immunocompetence decreases. While the asymptomatic ocular lesions occur in the earlier stages, the relentless destructive and blinding infections, especially the opportunistic ones occur in the later stages of the disease.

Progression of the disease causes decrease in CD4 cell count, which is strongly associated with occurrence of different ocular manifestations.

CD4 T. lymphocyte count has been used to predict the onset of certain ocular infection in HIV patients.

Increasing use of ART is improving the survival of AIDS patients and changing the scenario of ocular manifestations.

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The aetiological agent of AIDS, HIV belongs to the family of human retroviruses and the subfamily of lenti viruses. Ocular lesions mainly involve the posterior segment, which include-

HIV vasculopathy, infectious retinopathy or choroidopathy and rare neoplasms. Also, HIV vasculopathy or microangiopathy is the most common manifestation (40-60%) of AIDS in developed countries, which includes retinal haemorrhages, cotton-wool spots, microaneurysms, ischaemic maculopathy and telangiectatic vessels while large vessels disease is rarely seen.[3-5]

Cytomegalovirus (CMV) retinitis is one of the most common (15-40%) causes of infectious retinopathy in AIDS and its complications (Immune Recovery Uveitis (IRU) and retinal detachment) are the most common cause of visual morbidity in affected patients.[3]The involvement of the anterior segment is usually less and includes complicated cataract, anterior uveitis, fungal keratitis, herpes simplex and zoster keratitis, peripheral ulcerative keratitis and bacterial keratitis.[4-6]

Herpes zoster ophthalmicus and conjunctival squamous cell carcinoma are relatively common in developing countries.[7] An understanding of the ophthalmic presentations of HIV/AIDS in our environment is very important in the early recognition and prompt management of these disorders as well as aiding in the planning and provision of facilities for the appropriate care of affected persons.[8] The widespread use of HAART in the developed world has resulted in a sharp decline in the incidence of AIDS-related ophthalmic infections such as CMV retinitis.[9]In general, CD4 count has been used to predict the onset of certain ocular infections in AIDS patients, CD4 count less than 500 cells/mmis associated with Kaposi sarcoma, CD4 count less than 100 cells/mm is associated with retinal or conjunctival microvasculopathy, Varicella-Zoster Virus (VZV) retinitis and there is a significant incidence of CMV retinitis in patients with CD4 counts less than 50 cells/mm; therefore, a screening program is advisable for all those patients.[10]

The disease is having an immense impact on human being- affecting the economy, social life, education and the health of people. Patients with HIV/AIDS suffer from wide varieties of complications that are related to the infection. No organ of the body is spared from the virus or related diseases. The eye is an organ with wide-spectrum HIV-related manifestations. The ocular manifestations can be the presenting sign of a systemic infection in an otherwise asymptomatic HIV-positive person.

Blindness, due to HIV-related complications, is also one of the problems endangering the life of people living with HIV with prevalence ranging from 6.9%-23%.[11,12]

KIMS Hospital, Hubli, is a tertiary care centre, which provides care for HIV/AIDS patients with CD4 count, ART and ART plus treatment centre.

AIMS AND OBJECTIVES

1. To study the ocular manifestations in HIV/AIDS patients.
2. To study the relationship between ocular findings and CD4 count in HIV/AIDS patients.
3. To study the relationship between the various ocular lesions and visual determination.

This prospective study was done from May 2015-April 2016 at Outpatient Department of Ophthalmology, Karnataka Institute of Medical Sciences, Hubli, patients visiting the ART Centre, KIMS Hospital, Hubli.

Source of Data- Patients visiting the ART Centre, KIMS Hospital, Hubli, Outpatient Department of Ophthalmology KIMS Hospital, Hubli.
Study Design- Prospective study.
Study Period- May 2015 - April 2016.

Inclusion Criteria

All patients with positive HIV serology and CD4 count results were included in the study.

Exclusion Criteria

1. Diabetic patients.
2. Patients with any type of glaucoma.
3. Patients with any other pre-existing retinal diseases.
4. Critically-ill patients.

MATERIALS AND METHODS

All patients with positive HIV serology and CD4 count results will undergo thorough ophthalmologic examination using-

1. Visual acuity.
2. Slit-lamp examination.
3. Fundus, ultrasound B scan and oculomotor examination.

Ethical committee clearance has been obtained from Karnataka Institute of Medical Sciences, Hubli.

OBSERVATION AND RESULTS

Around 760 patients were presented to the ART Centre from April 2015 to March 2016.All 760 patients were screened for ocular manifestations in the Ophthalmology Department, 28 were found to have ocular manifestations and 5 patients were having refractive errors.

Among 33 patients with ocular manifestations, 17 were male patients and 16 were female patients.

The CD4 count of all 760 patients is as tabulated below (Table 1).

Out of 28 patients, 8 patients had CD4 count <100, 15 patients had CD4 count in the range of 100-300 and rest 5 had CD4 count >300.

Among 8 patients who were having CD4 count <100, 3(37.50%) patients were found to have lid abnormalities,2 patients had uveal diseases and remaining 3 patients had corneal, conjunctival and retinal problems, respectively.

Among 15 patients who were having CD4 count 100-300, 6(40.00%) patients had corneal problems, 4(26.66%) patients had retinal diseases,2(13.33%) patients had lid disorders and remaining 3 patients had conjunctival, vitreous and optic disc problems.

Among 5 patients who were having CD4 count >300, 2(20.00%) had optic disc abnormalities, 3 patients had corneal, uveal and retinal diseases, respectively.

Lid abnormalities included mainly blepharitis, meibomitis and Molluscum of lid. Corneal diseases included HZO keratitis, dry eye and corneal ulcer. Conjunctival diseases included squamous dysplasia. Uveal diseases included anterior uveitis. Vitreous diseases included vitritis. Retinal diseases included chorioretinal scar, exudative retinal detachment, macular oedema, toxoplasmosis and CMV retinitis. Optic disc abnormalities included papilloedema, optic atrophy and optic neuritis.

<100		100-300		>300	
Male	**Female**	**Male**	**Female**	**Male**	**Female**
88	60	216	180	130	86

CD4 Count	<100	100-300	>300
Lid	3(37.50%)	2(13.33%)	
Cornea	1(12.50%)	6(40.00%)	1(10.00%)
Conjunctiva	1(12.50%)	1(6.66%)	
Uvea	2(25.00%)		1(10.00%)
Vitreous		1(6.66%)	
Retina	1(12.00%)	4(26.66%)	1(10.00%)
Optic Disc		1(6.66%)	2(20.00%)

Table 1. The CD4 Count of all 760 Patients

Based on Site Involvement

Among 28 patients, 18(54.54%) were found to have anterior segment pathologies and 10(30.30%) were found to have posterior segment pathologies.

Anterior Segment (54.54%)	
Lid	5
Cornea	8
Conjunctiva	2
Uvea	3
Posterior Segment (30.30%)	
Vitreous	1
Retina	6
Optic disc	3

Table 2. Based on Site Involvement

Among 33 patients screened, the ocular manifestations were predominantly found in age group of 21-30yrs.,[10] followed by 9 patients in the age group of 41-50yrs., 5 patients in 11-20yrs. group, 4 patients in 31-40yrs. group, 4 patients in >50yrs. group and 1 patient was found to be <10yrs.

	<10 yrs.	**11-20 yrs.**	**21-30 yrs.**	**31-40 yrs.**	**41-50 yrs.**	**>50 yrs.**
Lid			2	2	2	
Cornea	1		3	1	1	
Conjunctiva					1	1
Uvea			1		1	1
Vitreous					1	
Retina		1	1	1	3	1
Optic disc		2	1			
Normal		2	2			1

Table 3. Based on Age

DISCUSSION

The present study was conducted at Karnataka Institute of Medical Sciences,Hubli. A total of 33 patients (17 males and 16 females) were evaluated for various ocular manifestationsand were on follow up andmanagement for HIV/AIDS in our department.

HIV infection in humans is considered pandemic by the World Health Organization (WHO).[13] HIV-related eye disease generally takes the form of opportunistic infections that can affect any of the ocular tissues from the eyelids to the retina. In particular, those conditions affecting the retina may lead to chronic visual impairment or blindness.

In the current study, ocular involvement was seen in 4.34% cases.

Among 28 patients who had ocular manifestations, 18(54.54%) were found to have anterior segment pathologies and 10(30.30%) were found to have posterior segment pathologies. Among 33 patients screened, the ocular manifestations were predominantly found in age group of 21-30yrs.,[10]followed by 9 patients in the age group of 41-50yrs.,5 patients in 11-20yrs. group, 4 patients in 31-40yrs. group,4 patients in >50yrs. group and 1 patient was found to be <10yrs.

Lid abnormalities included mainly blepharitis, meibomitis and Molluscum of lid. Corneal diseases included HZO keratitis, dry eye and corneal ulcer. Conjunctival diseases included squamous dysplasia. Uveal diseases included anterior uveitis. Vitreous diseases included vitritis. Retinal diseases included chorioretinal scar, exudative retinal detachment, macular oedema,toxoplasmosis and CMV retinitis. Optic disc abnormalities included papilloedema, optic atrophy and optic neuritis.

Among 33 patients, 17 were malesand 16 were females. So, there was no sex difference observed in manifestation of ocular diseases.

CD4+ T. lymphocyte counts can be a reliable predictor of ocular complications of HIV infections. This study found that 23 patients with CD4 count less than 300cells/µL had higher rate (100%) of ocular manifestations predominantly involving both the segments.

CONCLUSION

Prevalence of ocular manifestations correlated significantly with low CD4 count.Patients with CD4 count of 0-300cells/mm^3has a significantly higher prevalence of ocular manifestations than other patients. Mean CD4 count was 145/mm^3 in those patients having ocular manifestations.

Anterior segment involvement was the most common ocular manifestation encountered in our study and poor immune response of the patient (i.e., low CD4 count level).

Marked decline in prevalence of ocular manifestations in HIV patients in HAART era was noticed as compared to pre-HAART era.

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