Research Paper

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Posterior Segment Manifestations in HIV Positive patients –Original article

Medical Science

KEYWORDS : Posterior segment of eye, HIV, AIDS, CD4+ T cell count, CMV Retinopathy, HIV Retinopathy.

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ABSTRACT

Posterior segment ophthalmic manifestations are very common in HIV+ve patients. As the CD4+T cell count declines chances of acquiring opportunistic infections increases and which also can affect Posterior segment of eye. This study was carried out on 50 HIV+ve patients having posterior segment manifestation attending our ART centre at medical college hospital. We correlated their CD4+Tcell count with Posterior segment manifestations and found that CMV retinitis and HIV retinopathy were commonly seen in the patients with CD4+ T cell count < 100 cells/microL. Other manifestations were less commonly seen. All of these manifestations lead to severe visual impairments and compromise patient's life. Earlier diagnosis and treatment can be very much helpful in these patients.

Introduction -

HIV / AIDS is one of twenty-first century's challenges to human beings with manifestations affecting all organs of our body. Inspite of widespread use of HAART ocular manifestations of HIV/ AIDS affect approximately 50 to 75% of infected persons of which posterior segment involvement is most common. Posterior segment of eye comproises of structures posterior to lens and includes vitreous, retina, posterior uveal tract and optic nerve head. In HIV positive persons Posterior segment manifestations can be divided into four main categories: vasculopathy, opportunistic infections, unusual malignancies and neuro-ophthalmological manifestations. This study was carried out at out patient department of a medical college hospital. Purpose of this study was to determine posterior segment manifestations of HIV positive patients and their correlation with CD4+T cells count.

Aims and objectives:

- To study the posterior segment manifestations of HIV positive patients
- To correlate posterior segment manifestations and patient's CD4+T cell counts.

Materials and methods

The present study was conducted in ophthalmology out patient department and ART centre of medical college hospital during one year period. The study includes patients with posterior segment manifestations , already diagnosed HIV +ve patients and taking ART from the centre.

Sample size: 50 HIV positive patients with posterior segment manifestations were randomly selected and after due consent of them data was collected as per clinical manifestations , fundoscopic pictures and CD4+T cells count. This data was analysed by statistical methods to draw conclusions.

Observations:

Table No.1: Age & Sex

Age Group(Years)	Male	Female	Total
11-20	04	03	07
21-30	06	05	11
31-40	10	08	18
41-50	06	O4	10
51-60	02	02	04
Total	28	22	50

Following observations were made - Of the 50 patients studied 28 (56%) were males and 22 (44%) were females. The gender difference may be due to more males attending opd regularly than females due to social factors related to Indian culture like more promiscuity, increased tendency towards sexual exposure and more exposure to infectious agents due to outdoor activities. Biswas J.(2001)[1] observed that male to female ratio in HIV positive patients was 2.9 :1.

Age distribution of the patients studied showed that 07 (14%) were in the age group of 11to 20, 11 (22%) from 21 to 30 age group, 18(36%) from 31 to 40, 10(20%) patients from 41to 50 age group and 04 (08%) from 51 to 60 age group. Of these 39 patients (78%) were in the age group of 21 to 50 indicating working class of the population mostly affected by HIV , the most productive group of population which is really a concern. Young people in India are the most vulnerable to HIV as per [2].

Table No.2: Clinical Manifestations & No. of Patients

Clinical Manifestations	No. of patients
HIV Retinopathy	16
CMV Retinopathy	15
Retinal Detachment	05
Toxoplasma Retinitis	03
Vitreitis	03
Choreoretinitis	05
Optic atrophy	03

Of the clinical manifestations 16 (32%) patients had HIV retinopathy, 15 (30%) had CMV retinopathy, 5 (10%) had retinal detachment, 3 (6%) had toxoplasma retinitis, 3 (6%) had vitreitis, 5 (10%) had choreoretinitis and 3 (6%) patients were having optic atrophy. From the observations it is clear that commonest manifestations were HIV retinopathy and CMV retinitis comproising of 31 (62%) of the studied group. Other manifestations were less commonly seen.

Table No.3: CD4+ T Cell Count & Sex

CD4 + T Cell Count	Male	Female
Less than 50	09	07
51-100	07	07
101-200	06	04
More than 200	06	04

With reference to the CD4+Tcells count it can be seen from the study that 16 (32%) patients had CD4+Tcells count of less than 50, 14 (28%) had CD4+T cells count between 50 and 100, 10 (20%) had CD4+T cell count between 101 to 200 and 10 (20%) had CD4+T cell count of more than 200. It can be said from the study that as CD4+T cells count declines clinical manifestations become apparent . More and more opportunistic infections can be seen as CD4+T cell count falls below 100.

Table No.4 :Clinical Manifestation & CD4+ T cell count

	CD4+ T cell count				
Clinical Manifestation	<50	51-100	101-200	>200	Total
HIV Retinopathy	08	06	01	01	16
CMV Retinitis	06	04	03	02	15
Retinal Detachment	00	02	02	01	05
Toxoplasma Retinitis	01	00	01	01	03
Vitreoretinitis	00	01	01	01	03
Choreoretinitis	01	00	02	02	05
Optic Atrophy	00	01	00	02	03

When patients CD4+T cell count were correlated with ocular manifestations it can be seen that with CD4+T cell count of less than 50 HIV retinopathy, CMV retinitis Toxoplasma Retinitis and Choreoretinitis were common. In cases with CD4+T cell count between 51 to 100 , HIV Retinopahy , CMV retinitis , Vitreoretinitis , Retinal Detachment and optic atrophy were common. In cases with CD4+T cell count between 101 to 200 except for optic atrophy all of the above clinical manifestations were seen . In cases with CD4+T cell count more than 200 all of the above clinical manifestations were seen.

HIV retinopathy – In our study we have seen 16 cases of HIV retinopathy. All of them were having CD4+T cell count of less than 50 cells/microL. HIV related microangiopathy was the most common ocular lesion in patients with AIDS before the availability of HAART. With early treatment ,its prevalence has also decreased. The prevalence of microvasculopathy is inversely proportional to CD4+T cell count .Microvasculopathy manifests as cotton-wool spots located in the posterior pole. They have rounded borders and are usually oriented along the vascular arcades and represent focal areas of ischemia in the nerve fibre layer. Narsing Rao and Dugpal P. (1994)[3] . Biswas J.(2001)[1] quoted HIV retinopathy in 50-70% of AIDS cases. Biswas J. and Kannan V.(2002)[4] reported cotton wool spots in 20-50% with advanced HIV disease. Gupta A.K. and Krishna V (2004)[5] noted HIV retinopathy in 50% of HIV positive patients. Holland G.N.(1982)[6] reported cotton wool spots in 16 patients out of 30 HIV positive patients. Pepose J.S. (1985)[7] reported cotton wool spots in 71% of HIV positive 35 autopsy cases.

CMV retinitis- In our study CMV retinitis was seen in 15 (30%) patients. CMV retinitis is the most common AIDS related ocular opportunistic infection. Although its incidence has declined in western world since the advent of HAART , it still remains the leading cause of ocular morbity in developing countries Holbrook JT et al (2003)[8] . In India, CMV retinitis still remains the commonest ocular manifestation in AIDS cases [9,10]. It may be unilateral to start with but up to 52% will eventually develop bilateral disease. Kupperman et al[11]observed that CMV retinitis occurs almost exclusively in patients whose CD4+T cell count are less than 50 cells/ microL. In exceptionally rare instances , CMV retinitis may develop in patients with elevated CD4+T cell counts shortly after initiation of HAART. There are three clinical forms of CMV retinitis.

The classical form (pizza pie retinopathy or cottage cheese with ketchup) is characterized by confluent retinal necrosis with hemorrhage that develops mostly in the posterior retina [Figure 2A]. The advancing edge of these lesions is usually very sharp and spreads contiguously. Typically, over several weeks untreated lesions progress to full-thickness necrosis with resultant retinal gliosis and pigment epithelial atrophy. Patients often have loss of visual field or visual acuity and scotoma. In contrast, the indolent form is recognized as a granular lesion in the peripheral retina, often with little or no hemorrhage [Figure 2B]. Patients may notice floaters, or they may be asymptomatic. A third uncommon presentation is frosted branch angiitis [Figure 2C]. Because approximately 15% of patients with active CMV retinitis are asymptomatic, routine screening with dilated indirect ophthalmoscopy has been recommended at three-month intervals in patients with CD4+ counts less than 50 cells/μl.[14] Cytomegalovirus retinitis may result in either serous or rhegmatogenous retinal detachment, although the latter is much more common. Rhegmatogenous retinal detachment has been reported in 13 to 29% of patients with CMV retinitis and may occur during the active or healed phase of the disease. However, since the advent of HAART, incidence of retinal detachment has decreased by approximately 60 to 77% in the western world.[15] In contrast, in our series, the incidence of CMV-related retinal detachment was found to have increased [Table 1]. This may be due to higher number of patients taking inappropriate HAART, or people taking HAART have larger areas of healed CMV retinitis which eventually develop necrotic holes leading to detachment. Various approaches including pars plana vitrectomy (PPV) with gas or silicone oil tamponade (preferably high viscosity 5000CS), scleral buckling and laser demarcation have been effective in the repair of retinal detachments related to CMV retinitis.[16]

Sison et al (1991)[12] reported CMV retinitis in 1.8% of AIDS patients. Narsing Rao and Duggal P. (1994)[3] reported CMV retinitis in 15-40% of AIDS patients .Hoover et al (1996) [13] reported that 19% of HIV positive patients , developed CMV retinitis before CD4+T cell counts were less than 50/mm^3 . Biswas j. and Kannan M. (2002)[4] ,noted CMV retinitis in 15 to 40% of HIV positive patients particularly those with CD4+T cell count of less than 100cells/microL. Biswas j.(2001)[1] ,found CMV retinitis in patients with CD4+T cell count of less than 100cells/microL. Gupta A.K. and Krishna V. (2004)[5] reported CMV retinitis in 25% of AIDS patients.

Retinal detachment: In our study retinal detachment was seen in 5 patients. Of these 2 patients had CD4+T cells count of< 50 , 2 had CD4+T cells count between 50 and 100 and 1 patient was having CD4+T cell count of > 200. Freeman et al (1993)[14] , evaluated the risk factors for development of retinal detachment in patients with CMV retinitis and found that eyes with peripheral involvement greater than 25% had a five-fold risk for detachment , compared to eyes with 10% involvement. If there was retinitis activity and more than 25% peripheral involvement the risk increased to 24 fold. Chung et al (1993)[15] , reported that retinal detachment in acute retinal necrosis occurred in 70% of cases. Acute retinal necrosis is fulminant retinal vasoocclusive necrotizing retinitisd that may complicate viral infections like Varicella zoster, CMV and Herpes simplex virus. After resolution of retinitis , traction between vitreous and retina causes retinal break leading to rhegmatogenous RD. About 75% of eyes with acute retinal necrosis develop rhegmatogenous RD after 2-3 years of onset.

Toxoplasma retinitis: In our study 3 patients had toxoplasma retinitis . Of these 2 were having CD4+T cell count of < 50 and 1 patient had CD4+T cell count between 50 to 100. Narsing Rao(1994)[16] has quoted toxoplasma retinochoroiditis in 18-38% of HIV patients. Biswas J(2001) [1] observed toxoplasma retinitis in 10% of HIV positive patients.A study by Holland GN reported toxoplasma retinitis accounted for about 1% of the HIV positive cases.Pfafil et al (1992) [17] reported toxoplasma retinochoriditis in 2.7% of HIV positive patients. Jabs DA (1995) [18] reported occular toxoplasma retinitis in < 1% of patients with HIV.

Vitreitis : in our study 3 patients had vitreitis . All of them had CD4+T cell count of > 200.

Chorioretinitis: in our study chorioretinitis was seen in 4 patients . 2 of them had CD4+T cell count of < 50 and other 2 had CD4+T cell count between 50 to 100. Optic atrophy: In our study optic atrophy was seen in 4 patients. 2 had CD4+T cell count of <50, 1 had CD4+T cell count between 50 to 100 and 1 had CD4+T cell count between 100to 200. Biswas J.(2001)[1] observed optic atrophy in 7% of HIV positive patients. Muccioli(1994) [19] reported optic atrophy in 1.6% of HIV cases. Tornerup (2000)[20]

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reported a case of HSV-induced acute retinal necrosis with optic neuritis. Muller B.(2002) [21] revealed from study that ARN may be complicated by optic neuropathy which is one of the main cause leading to blindness.

Summary: In this study done on 50 HIV positive patients most of the patients 39(78%) were in the age group of 21 to 50 years . With relation to CD4+T cell count more immunosuppression lead to more ocular manifestations (opportunistic infections), in the study 30 (60%) patients had CD4+T cell count of < 100.

HIV retinopathy and CMV retinitis were the most common manifestations amounting of 62% of cases, other manifestations were seen less commonly. Conclusion: Posterior segment ophthalmic manifestations are very common in HIV positive patients. They occur as a result of direct effect of virus or due to increased susceptibility of the opportunistic infections . Periodic ophthalmic evaluation and intensification of HAART to increase the CD4+T cell count will help these patients in reducing ocular morbidity.

Abbreviations:

ART- Antiretroviral therapy, HAART – Highly active antiretroviral therapy, AIDS – Acquired immunodeficiency syndrome, CD- Cluster of differentiation, CMV – Cytomegalovirus, ARN – Acute retinal necrosis , HIV – Human immunodeficiency virus.

Conflicts of interest- Nil.

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