The Role of HAART and CD4 Count in HIV Retinopathy

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ABSTRACT

Introduction: Human immunodeficiency virus (HIV) infection and Aquired Immuno-Deficiency Syndrome (AIDS) is a global pandemic. Study aimed to record the retinal manifestations in patients with HIV according to their CD4 count and HAART status.

Material and methods: A total of 100 patients with HIV were examined over a period of 7 months. The patients were selected on the basis of confirmed sero-positive HIV. They were thouroghly examined under mydriasis with indirect ophthalmoscope and fundus photographs were taken whenever possible.

Results: 32 patients (32%) were found having fundus manifestations. Out of which majority had hiv microangiopathy and few had retinitis or choroiditis.

Conclusion: There is higher incidence of retinal findings in non-HAART group and in patients with CD4<100/ml in both groups and HAART associated with reduced incidence of retinal manifestations.

Keywords: Incidence, Retinal Manifestations, Fundus, CD4 Count, HAART

INTRODUCTION

The recent World Health Organization (WHO) estimate of the total HIV burden in the world is about 33.2 million. Highly Active Antiretroviral Therapy (HAART) has changed the clinical and prognostic outcome of fundus changes in the HIV seropositive patients.[1] The use of highly active antiretroviral therapy (HAART), which consists of a combination of nucleoside reverse transcriptase inhibitors, HIV protease inhibitors and non nucleoside reverse transcriptase inhibitors, has decreased plasma levels of HIV RNA and increased CD4+ T lymphocytes counts, improving the immune function of patients with HIV infection.[6,7,8]The clinical presentation of HIV related diseases may be modified by HAART, which has dramatically improved the prognosis of HIV infection. During the early phase of AIDS, ophthalmic manifestations of the disease infact helps to suspect underlying HIV infection and its associated opportunistic infections.[2,3]

Ophthalmic manifestations of HIV may involve anterior segment and posterior segment including various infections and tumors of the periocular tissues, HIV vasculopathy(retinal haemorrhages, cotton-wool spots, microaneurysms, ischaemic maculopathy and telangiectatic vessels), infectious retinopathy or choroidopathy, and rare neoplasms.[4,5]

Study aimed to record the retinal manifestations in patients with HIV according to their CD4 count and HAART status.

MATERIAL AND METHODS

This prospective non-interventional descriptive study was conducted on 100 adult patients with confirmed seropositive HIV status, over a period of 7 months from October 2014 to April 2015 at Silchar Medical College and Hospital. All patients underwent detailed ophthalmic evaluation with dilated retinal examination using indirect ophthalmoscopy and fundus photographs were taken whenever possible. Relevant history and data from laboratory investigations were analysed. Latest CD4 counts also recorded and the patients classified according to their CD4 status. The patients were divided into HAART group and non HAART group. Informed consent obtained from all the participants.

Exclusion criteria - Documented cases of diabetes, hypertension, other ocular diseases and other systemic diseases.

Data obtained were tabulated in MIrosoft Excel 2007 and required statistical analysis was done using IBM SPSS 22.0. A p value less than 0.05 was taken as statistically significant.

RESULTS

A total of 100 patients were included in the study. Out of these 100, 64 (64%) were males and 36 (36%) were females. Distribution of fundus findings with gender of all patients were shown in table 01. Among these 100 patients 32 (32%) had fundus manifestations. Of these 29/32 (89%) had microangiopathy while 3/32 (11%) had retinitis. 22 (70%) out of 32 with fundus manifestations were males while 10 (30%) were females. There was no significant difference noted in retinal manifestations among males and females. (p=0.68).

32 patients from the total study population **(100)** showing fundus manifestations. Fundus findings were more prevalent in patients with CD4 count of <200 cells/ul. Among the 34 patients, fundus findings predominated in patients with CD4 count <200cells/ul ie. 28/32(87%). While it was 4/32 (13%) in patients with CD4 count >200 cells/ul (figure-1, table-2). The difference was found to be statistically significant. (p=0.003)

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Gender	Fundus findings		Total
	With fundus manifestations	Without fundus manifestations	
Male	22	42	64
Female	10	26	36
Total	32	68	100
p > 0.05			

Table-1: Fundus findings and Gender

Haart status	Fundus findings		Total
	With fundus manifestations	Without fundus manifestations	
Haart	02	36	38
Non haart	30	32	62
Total	32	68	100
p < 0.05			

Table-2: Fundus findings and HAART status

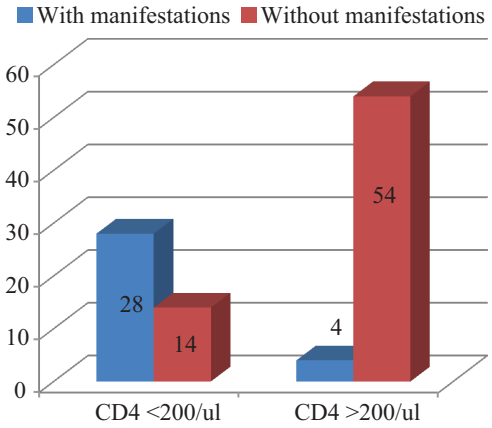

Figure-1: Prevalence of fundus findings with CD4 cell count

DISCUSSION

HIV infection can manifest in a variety of ways in and around the eyes, and these manifestations vary according to HIV disease severity, specifically, CD4+ T lymphocyte counts. Acute infection with HIV causes nonspecific symptoms of viral infection and lymphadenopathy, followed by a minimally symptomatic phase during which CD4+ T lymphocyte counts decline from the normal values of 600 to 1500 cells/mm^3. Below 200 cells/mm^3, symptoms occur frequently from opportunistic infections, malignancies, and generalized malaise. Ocular manifestations attributable to HIV infection vary according to CD4+ T lymphocyte counts.[9] Cytomegalovirus retinitis and mycobacterium-avium complex disease are usually seen in patients with profound reductions of CD4 counts.[10] In our study we found majority of patients with fundus findings ie.30/34 (91%) had CD4 count of <200 cells/ul. While remaining 3/34 (9%) had CD4 count of >200 cells/ul. There was no significant difference noted in retinal manifestations among males and females.

Microangiopathy is the most common ocular manifestation of HIV infection. Cotton wool patches are the most typical. They can be distinguished from infectious retinitis by a size less than 500 microns, a feathered edge, and transience, with fading over 6 to 8 weeks are mainly localized on the posterior pole. The CWS result from occlusion of precapillary arterioles, normally do no affect visual acuity and do not require treatment Pathologically, the CWS are nerve fiber layer infarcts, related to accumulations of axoplasmic debris, subsequent to obstruction of axoplasmic flow.[11] They may represent an increased risk for cytomegalovirus (CMV) retinitis. AIDS patients with CWS should have close follow up.[12] Gomez 2009 Microangiopathy may also be responsible for alterations in visual function.Majority of our patients with fundus manifestations showed HIV microangiopathy which includes cotton wool spots, pale fundus, microaneurysm, retinal hemorrhages (91%%) followed by retinitis and choroiditis (9%). The highest percentage of patients had cotton wool spots (58.82%) followed by narrowing of vessels. This was not consistent with other studies which may probably be due to small sample size.

Out of 100 patients 44 were on HAART and rest 56 were not on HAART. Majority of patients with fundus findings were from the non-HAART group ie.26/34 () and 8/34 patients with fundus findings were from HAART group. Treatment of HIV infection with HAART (Highly Active Antiretroviral Therapy) seeks to inhibit progression to AIDS (Defined by a CD4 count of <200 cells/mm3) or death. This is achieved by reducing plasma HIV RNA to permanently low levels,reduction in the viral load and a rise in CD4 cell counts which helps in improvement in the immune status of the individual.[13] With the advent of HAART, morbidity and mortality related to HIV and AIDS have drastically decreased in the developed world, but since more patients live longer and there are more HIV-positive patients, the overall population based prevalence would be expected to creep up. However, the situation in the developing countries is still grim even with advent of HAART. In a study by Goldberg et al, they showed that in the pre HAART era, CMV retinitis was tha most common HIV associated retinopathy, occurring in 20%-40% of patients. As copared to that, in the HAART era there was a 80% decline in the incidence of CMV retinitis. The incidence, visual morbidity and mortality of CMV retinitis and other HIV-associated retinopathies decreased in the era of HAART.[14] Similarly, another study from Croatia found that the mortality had decreased to 59.3%, vascular changes had reduced to 54.3% and incidence of CMV retinitis reduced from 57.2% to 7.6% from pre-HAART to post –HAART era.[15]

The prevalence of fundus findings among HIV seropositive patients was found to be similar with other developing countries. The retinal manifestations incidence is also comparable to other Asian countries.[16-17]

CONCLUSION

From our study we can conclude that prevalence of fundus manifestations is more in patients not receiving HAART. Though HAART therapy found to reduce the incidence of fundus lesions but low CD4 count is strongly related to increased prevalence of fundus manifestations. Cotton wool spots are most common retinal manifestations in patients

with HIV retinopathy.

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