



ORIGINAL RESEARCH PAPER

Ophthalmology

A STUDY ON OPHTHALMIC CHANGES AMONGST THE PLWH ON HAART IN A TERTIARY CARE HOSPITAL

KEY WORDS: Ocular manifestation, PLWH patient, HAART therapy

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ABSTRACT

Background: Human Immunodeficiency Virus(HIV) currently infects 38.0 millions of people across the world(1). Ocular manifestation in HIV positive and AIDS patients range from simple Blepharitis to severe blinding condition like CMV retinitis. Due to the potentially devastating and rapid course of retinal opportunistic infections, all person with HIV disease should undergo routine baseline ophthalmic evaluation. **Materials and methodology:** An epidemiological cross-sectional study carried out at tertiary referral center. Purposive sampling of 187 patients was done. Written informed consent were taken and confidentiality of data was strictly maintained. Detailed history was taken and data regarding mode of transmission, CD4 cell count before starting of HAART and 6 month after beginning of HAART , WHO clinical stage and duration since HIV diagnosis, HAART regime and duration of HAART regime were noted. Ophthalmic examinations including visual acuity, slit lamp examination of anterior segment and dilated ophthalmoscopy for posterior segment was done. **Conclusion:** HIV remains a global health problem despite tremendous and ongoing treatment. With the introduction of HAART the life expectancy of the patients have significantly increased, on the other hand ocular manifestation continue to occur. All patients on HAART must under go ocular examination. CD4 count have to be strictly considered while monitoring. It serve both as a risk factor as well as an indicator of opportunistic infection.

INTRODUCTION

Human immunodeficiency virus (HIV) mediated Acquired Immune Deficiency Syndrome (AIDS) is one of the most feared infectious disease of the late 20th century. Ocular involvement in HIV infection occurs most commonly due to opportunistic infection and neoplasm^(2,3,4) Ocular complication are common in human immunodeficiency virus infected individuals with at least 50-70% of infected individuals expected to develop ocular disease at some point of time during the course of the disease in the pre highly active antiretroviral therapy (HAART) era^(5,6). The spectrum of HIV associated ophthalmic disease is very broad and ranges from adnexal disorder to posterior segment disease including the optic nerve and the optic tract.

The introduction of highly active antiretroviral therapy (HAART) has led to a decrease in the incidence of ocular opportunistic infections causing retinitis in HIV positive persons as a result of improved immune status⁽⁷⁾. HAART therapy has induced a decrease in the incidence of HIV related microangiopathy and opportunistic retinal infection like herpes zoster/ herpes simplex related retinitis and presumed P. carinii choroidopathy through there may be an increase in the occurrence of new lesion such as dry eye, cataract and drug related side effects.

All HIV patients should undergo complete ocular examination as even in asymptomatic cases ophthalmological findings were present and early detection will helpful in preventing further progress of the disease.

METHODOLOGY

An epidemiological Cross- sectional study carried out at the tertiary referral center and teaching hospital.

The study was subjected for approval from Institution Ethical Committee.

Written informed consent was taken from all those who are going to participate in the study.

Confidentiality of all the participants in the study was strictly maintained. Demographic data and medical information was obtained by a combination of direct questioning to patient and their relatives along with the details obtained by the review of the medical case noted. Purposive sampling of the total 187 patients was done according inclusion and exclusion criteria.

INCLUSION CRITERIA

All those who are

- Giving consent
- More than 18 years of age
- Having proper compliance for HAART treatment for which they are selected
- Patient having opportunistic infection are also part of study.

EXCLUSION CRITERIA

Those

- Who don't give consent
- Less than 18 years of age
- Pregnant mother
- Not much compliant on treatment
- Having decrease CD₄ count after starting the HAART

Data obtained include mode of transmission, present CD₄ cell count before commencement of HAART and after 6 month of treatment , WHO clinical stage and duration since HIV diagnosis, HAART regime and duration of HAART regime. None of these information had been disclosed to personnel conducting the ophthalmic examination.

In addition, standardized symptom screening was conducted as related to ocular pathology; this included questions relating to impairment of vision, ocular pain and presence of

floaters. Ophthalmic examination was conducted. BCVA was measured using snellen visual acuity charts.

Visual impairment and blindness was defined as per WHO guidelines. Visual impairment is defined as presenting visual acuity of less than 6/18 (0.3 log MAR), but equal to or better than 3/60 (0.05), and blindness as presenting visual acuity of 3/60 or worse in the better eye.

Ophthalmic diagnosis was made clinically based upon slit lamp biomicroscopic examination of the anterior segment (eyelids, conjunctiva, cornea, anterior chamber) and dilated indirect ophthalmoscopy to provide views of the central and peripheral retina.

The diagnosis of HIV- related eye conditions such as HIV retinopathy, tuberculoma, choroiditis, cytomegalovirus retinitis (CMVR) was based upon characteristic clinical features using standardized descriptions⁽⁶⁾. All participants with active ocular disease (whether or not related to HIV) were further assessed for treatment.

Study was conducted according to the principles expressed in the declaration of Helsinki.

RESULTS AND DISCUSSION

Table 1: Age and Sex distribution

Age Group (Year)	Male	Female	Total
20-29	25	15	40
30-39	51	21	72
40-49	36	15	51
50-59	9	4	13
60-69	3	8	11
Total	124(66.3%)	63(33.7%)	187(100%)

Out of total 187 patients male and female were 124 and 63 respectively. The data includes the proportion Male:Female is approximately 2:1. 86.1% of the patients are in 20-49 yr, "Active Reproductive Age Group". This age group is sensitive of being victim of transmission of HIV. The possible reason may be

- Increase migrant population
- Early medical attention
- Increasing homosexuality

Table 2: WHO stage wise distribution among both gender

Who stage	Male	Female	Total
I	101	49	150
II	14	10	24
III	6	4	10
IV	3	0	3
Total	124	63	187

Data showed that from total 187 patients 150 (80%) patients were from WHO stage I, rest 37 patients were from stage II, III and IV. There were total 8 different HAART regime of which 104(56%) patients were on Zidovudine+Lamivudine+ Nevirapine based regime which is the most common 1st line regime. 80% were from stage WHO stage I and hence Zidovudine based regime are adequate.

Table 3: Improvement in CD4 count for the current WHO stage after HAART

Improvement in CD4 count	WHO stage				Total
	I	II	III	IV	
<100	67	8	5	1	81
100-250	48	10	2	0	60
251-500	25	4	2	2	33

>500	10	2	1	0	13
Total	150	24	10	3	187

The data showed the maximum improvement in CD4 count was seen in the WHO stage I patient.

The maximum patients(141) had improvement in the range of 0-250, after that HAART.

This correlates with the well documented findings ' Importance of baseline characteristic of patient(WHO stage and baseline CD4 count) for the prognosis after starting HAART.'

Table 4: Opportunistic infections among patients of various WHO stage

WHO Stage	Opportunistic infection	No opportunistic infection
I	25	125
II	8	16
III	6	4
IV	3	0

The data showed that 25 patients from WHO stage I had opportunistic infections but prevalence of opportunistic infection present was statistically significant (P value- 0.001) and associated with higher WHO stage (III and IV).

From 187 patients 42(22.5%) patients had opportunistic infection, from them 25 patients had the pulmonary tuberculosis the most common opportunistic infection.

Table 5: Anterior segment findings & duration of HAART

Duration of HAART	Allergic conjunctivitis	Meibomian glands	Squamous blepharitis	Chalazion	Herpetic keratitis	Iridocyclitis	Cataracts	Others	NA	Total
<3month	6	10	1	2	0	1	21	36	51	128
3-6 month	18	8	7	2	1	2	15	36	48	137
6-12 month	17	0	3	0	5	2	13	12	33	85
>12 month	4	0	2	0	0	2	12	6	18	44
Total	45	18	13	4	6	7	61	90	150	

Here findings like lacrimal sac abnormality, subconjunctival hemorrhage, pterygium, corneal degeneration, old corneal opacity, pseudophakia were considered in "others".

Among the ophthalmic manifestation, 32(17%) patients were asymptomatic, while among the symptomatic (155) the most common presenting symptom was diminished vision in 79(51%) in either or both eye.

Among all anterior segment findings cataract was the most common findings and 61 patients had cataract among them 44 patients were between 30 to 49 year of age. Analysis showed that there was significant relation between age group >40 year and the presence of cataract (P value= 0.001). Positive relation of presence of cataract in the group of more than 40 year showed the premature genesis of cataract especially in the group of 30- 49year 46 eyes had allergic manifestation 6 eye with herpetic keratitis and 5 eyes were found to have iridocyclitis. All the manifestation were associated with immune system, might be indirectly related to H A A R T induced immune regeneration.

Table 6: Effect of duration of HAART on posterior segment lesion

Duration of HAART	HIV Retinopathy	Epiretinal membrane	Choroiditis and Exudative RD	Choroidal mass	CMV Retinitis	Glucoma	Others	NA	Total

<3 month	10	0	0	0	0	5	56	54	125
3-6 month	4	0	1	1	0	6	56	57	125
6-12 month	3	1	1	1	1	1	40	35	83
>12 month	0	2	0	0	0	1	17	17	37
Total	17	3	2	2	1	13	169	163	

In the posterior segment finding, 17 eyes had HIV retinopathy, 3 had epiretinal membrane, 2 had choroiditis, 2 had choroidal mass, 1 had CMV retinitis, 1 had branch retinal vein occlusion, 13 eyes had glaucomatous disc.

DISCUSSION:

Gharai S & venkatesh P (2008)⁽⁹⁾ study had 83% symptomatic patients and 17% asymptomatic patients where as in present study symptomatic 155(83%) and symptomatic 32(17%) , similar ratio of asymptomatic patient irrespective of the massive difference in WHO stage of the patients make it clear that, the ophthalmic manifestation in the HIV can be the accidental finding and hence required routine ophthalmic work up.

The study by Kenneth P. Mitton, Toshikazu Kamiya, Santa J. Tumminia and Paul Russell⁽¹⁰⁾ had shown that, HIV-1 Protease expression in the eye lens display degradation of some lens hydration state, which the trigger of cataract formation. Present study had derived significant association of prevalence of cataract in the patient of forties.

According to WHO's 2007 report, the prevalence of all forms of TB in Ethiopia was estimated at 546 per 100,000 populations⁽¹¹⁾. In present study 42(22.5%) patients had opportunistic infection, from them 25(13.37%) patients had the pulmonary tuberculosis.

Other studies from India which reported high risk of developing Opportunistic infections such as TB, Pneumocystis jiroveci pneumonia, and cryptococcal meningitis among patients with CD4 counts <200 cells/mm³⁽¹²⁻¹⁴⁾

Dinesh K Sahu et al(1999)⁽¹⁵⁾ and study showed 34% patients had HIV retinopathy whereas, present study showed 4.55% J Biswas et al(1999)⁽¹⁶⁾ study showed 5.7% patients had choroiditis and 21.4% had CMV retinitis whereas in present study it was 2% and 1% respectively.

Lesser frequency and intensity of all the ophthalmic findings in the present study with respect to the other studies, correlates with the fact of dominance of WHO stage 1 patient in the present study.

CONCLUSION

HIV infection is a communicable disease present in population, affecting commonly the reproductive age group. Disease prevention programme must be undertaken targeting unskilled population.

HIV manifests in the eye either directly in the form of viral load or because of low immunity thereby increasing chances for opportunistic infections. Higher the WHO stage the more chances of opportunistic infection.

With the introduction of HAART, the life expectancy of the patients have significantly increased. However, most patients were unaware of their ophthalmic status so once the patient is started on HAART, he / she must undergo at least six monthly ocular examination with strictly CD4 cell count monitoring.

Hence, the present study strongly emphasize the importance of routine ophthalmic screening because earlier the diagnosis, better the outcome.

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