



Original Research Article

A spectrum of ocular manifestations in HIV/AIDS Patients: A retrospective analysis at a tertiary care centre in South India

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ABSTRACT

Aim: To evaluate the prevalence of Ocular manifestations in HIV/AIDS patients and its correlation with CD4 counts

Materials and Methods: The ophthalmology OPD records of 100 HIV positive patients who attended Ophthalmology OPD (referred from ART centre in the Institute) for screening to rule out ocular manifestations in the period of Jan 2009 to Dec 2009 were evaluated retrospectively.

Results: Out of 100 patients evaluated, ocular manifestations were seen in 54%. The percentage of patients with Anterior segment manifestations, Posterior segment manifestations and Adnexal manifestations were 12.96%, 31.48% and 79.62% respectively. Conjunctival microvasculopathy was the most common Ocular manifestations seen in 36% of the patients. HIV microangiopathy was seen in 10% of the patients and was the most common Posterior segment manifestations. Sight threatening complications like CMV retinitis was seen in 4% of the patients. 60.8% of patients with ocular manifestations had CD4 count less than 100 cells/cu.mm. With the decrease in the CD4 count, the prevalence of Ocular manifestations increased. Most common systemic association was Tuberculosis.

Conclusion: Though the prevalence of ocular manifestations is low when compared with the previous studies, Sight threatening ocular manifestations are seen frequently in HIV patients due to increased longevity of the patients with HAART therapy and also due to increased duration for the immune system to mature to act against the opportunistic infections. So frequent Ophthalmic examination should be made mandatory for all HIV patients with CD 4 count < 400 cells / cu.mm even if the patients are on HAART therapy.

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1. Introduction

HIV/AIDS is a multisystem disease characterised by profound disruption of the Immune system and a tendency for various opportunistic infections and neoplasms.

The prevalence of HIV as per 2017 India HIV estimation was 0.22% among adults.¹ The number of People Living with HIV was estimated at 21.40 lakhs in 2017 compared with 22.26 lakhs in 2007. With the introduction of HAART therapy, increased awareness among High risk group and Targeted Intervention programme under National Control of AIDS Programme (NACP), the estimated number of new

HIV infection has decreased to 87.58 (36.45 – 172.90) in 2017, showing new HIV infection decline by 85% since the peak of 1995 and by 27% between 2010-2017.

Ocular manifestations are seen in 50 – 75% of HIV patients even in HAART era. Life time cumulative risk of developing one ocular lesion in HIV patients ranges from 52 – 100%.² CD 4 lymphocyte count is a reliable predictor of ocular complications in HIV patients. Lower the CD4 Count, higher will be the incidence of ocular manifestations.

Ocular lesions can be due to opportunistic infections, immunological reactions, neoplasms and by HIV infection per se. It can affect almost all the structures of the eye. Some of these manifestations are potentially vision threatening. Sometimes, ocular lesions may be the first

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clinical presentation and can help the clinician suspect the underlying HIV infection. Routine ocular screening with dilated fundus examination has been recommended at three monthly intervals in patients with CD4 counts below 50 cells/ μ l.³ The purpose of this study is to determine the prevalence of ocular manifestations among HIV patients on routine ophthalmic screening and to determine its correlation with CD4 count.

2. Materials and Methods

The records of 100 HIV patients who was referred routinely from ART centre (irrespective of symptoms and CD4 count) to Ophthalmology OPD Govt Rajaji Hospital, Madurai from Jan 2009 to Dec 2009 to rule out any ocular manifestations were selected and evaluated. Age, sex, CD4 count, symptoms, treatment history (HAART, ATT, etc.) were noted. Visual acuity was recorded with Snellen's chart, the anterior segment was examined under Slit lamp biomicroscope, dilated Fundus examination was done with 90 D lens and Indirect Ophthalmoscope with 20 D lens.

These individual datas were analysed by Percentage.

3. Observation and Results

The OPD records of 100 HIV patients, Males were 60 (60%) and Females were 40(40%). Majority of the patients in this study were in the age group of 31 – 40 years (40%) and 21 – 30 years (35.5%) which corresponds to the sexually active group. Table 1 shows the Age distribution of the patients.

Table 1: Age distribution

Age in years	No of cases	%
0 - 10	3	3
11 - 20	3	3
21 – 30	32	32
31 – 40	41	41
41 – 50	18	18
50 – 60	3	3
>60	0	0

Majority of the patients were asymptomatic. Only 12 % of patients were symptomatic. Defective vision being the predominant symptom, patients with CMV retinitis and Toxoplasmosis had symptoms of defective vision and/or floaters. HIV microangiopathy and conjunctivalmicrovasculopathy patients were asymptomatic.

The most common systemic disease associated with HIV infection was Tuberculosis seen in 24% of patients followed by Oral candidiasis seen in 10 %. Genital/Oral Herpes, Cryptococcalmeningitis , AIDS dementia complex, anemia were also seen.

Among 100 patients, 18 patients were on HAART therapy. Out of these patients, 13 (72%) had ocular manifestations. Among 82 patients who were not on

HAART therapy, only 41(50%) patients had ocular manifestations.

CD4 T cell count is an important predictor of Ocular manifestations in HIV patients. CD4 count and its correlation with ocular manifestations are given in Table 2. CD4 count is inversely related to the ocular manifestations in HIV patients with the decrease in the CD4 count, the immunity decreases leading to increase in the occurrence of ocular lesions.

Table 2: CD₄ count and ocular manifestations

CD4 count	Total no of patients	No of patients with ocular manifestations
< 100	23(23%)	14(60.87%)
100 – 200	30(30%)	16(53.3%)
201 – 300	19(19%)	11(57.9%)
301 – 400	13(13%)	6(46%)
>400	15(15%)	7(46.6%)
Total		54

Ocular manifestations were seen in 54%. The percentage of patients with Anterior segment manifestations, Posterior segment manifestations and Adnexal manifestations were 12.96 %, 31.48 % and 79.62% respectively.

3.1. Anterior Segment Manifestations

Out of 7 patients, 5 had iritis and 2 had Dry eye. Among these patients, 1 patient was associated with Cytomegalovirus (CMV) retinitis, 1 patient with Toxoplasmoretinitis and I had Panuveitis. 2 patients had Festooned pupil suggesting Old iritis. No cases of keratitis were reported in this study.

3.2. Posterior Segment Manifestations

HIV microangiopathy was the most common retinal manifestations in this study affecting 10% of patients. Cotton wool spots were the most common manifestations followed by retinal hemorrhages. Table 3 gives HIV microangiopathy and its correlation with CD4 count. With the decrease in the CD4 count, the incidence of HIV microangiopathy increases. Table 3: CD4 count and HIV microangiopathy

Table 3:

CD 4 count	HIV microangiopathy	Percentage
< 100	5	21.7%
100 – 199	2	6.7%
200 – 299	1	5.26%
300 - 399	0	0%
>400	2	13.33%
TOTAL	10	

Table 4 shows HIV microangiopathy and its correlation with age. As the age increases, the incidence of HIV microangiopathy has also been increasing in this study.

Table 4:

Age in years	HIV microangiopathy	Percentage
0 - 10	0	0%
11 - 20	0	0%
21 - 30	2	6.25%
31 - 40	4	9.75%
41 - 50	4	22.2%
50 - 60	0	0%
>60	0	0%

CMV retinitis was seen in 4 patients. All 4 patients were on HAART therapy. Table 6 shows CMV retinitis and its correlation with CD4 count.

Table 5:

CD 4 count	No. of cases of cmv retinitis	On haart
< 100	1	Yes
100 - 199	2	Yes
200 - 299	1	Yes
300 - 399	0	
>400	0	
Total	4	

Toxoplasma retinochoroiditis was seen in 1 patient, Panuveitis in one patient and Old Chorioretinal scar in 1 patient.

Adnexal Manifestations

Conjunctival microvasculopathy seen in 36% of the patients was the most common ocular manifestation seen in this study. Other adnexal manifestations are listed in the table 6. Keratitis was not seen in this study.

Table 6: Adnexal Manifestations

Adnexal manifestations	No. of patients	Percentage
Conjunctival microvasculopathy	36	36 %
Allergic conjunctivitis	2	2%
Viral conjunctivitis	1	1%
Ocular Surface Squamous Neoplasia (OSSN)	1	1%
HZO	1	1%
Molluscum of the lid	1	1%
Blepharitis	1	1%
Lacrimal fistula	1	1%

3.3. Neuro-Ophthalmic Manifestations

Neuro-ophthalmic manifestations were seen in 4% of patients. 1 patient had Both eye Papilloedema, 1 patient had secondary optic atrophy with bilateral Sixth cranial

nerve palsy secondary to Cryptococcal meningitis, 1 patient had Primary Optic atrophy associated with AIDS dementia complex. LMN type Facial nerve palsy was seen in 1 patient. Majority of these manifestations were secondary to CNS lesions.

4. Discussion

In this study, majority of the patients were in the age group of 20 - 40 years (70%) . This is attributed to the fact that this being the sexually active age group, the risk of exposure is high. The increased awareness of the disease and early reporting in this age group can also be a contributing factor. The males were more commonly affected with HIV infection than the females in the ratio is 1.5: 1.

The most common systemic disease associated with HIV patients was Tuberculosis seen in 24% of patients since TB is more prevalent in India. Studies^{4,5} conducted in India also concluded Tuberculosis as the most common Systemic association with HIV patients.

CD4 T cell count is an important predictor of immune suppression in HIV patients. In this study, 11% of patients had CD4 <50 cells /mm³, 23% had CD4 count <100 cells/mm³ and 53% had CD4 count < 200 cells/mm³. 72% of patients with CD4 count < 50cells/mm³ had ocular manifestations, 60.87% of patients with CD4 count < 100 cells/mm³ and 53.3% of patients with CD4 count between 100 - 200 cells/mm³ had ocular manifestations. The observation concludes that the immunity decreases with the decline in CD4 count, thereby increase in the incidence of opportunistic infections, malignancies and other manifestations in HIV patients.

Majority of the patients are asymptomatic since this study included patients who came for routine ophthalmic screening. Only 12% of patients are symptomatic. Defective vision being the predominant symptom, patients with CMV retinitis and Toxoplasmosis are symptomatic. HIV microangiopathy being the most common Posterior segment manifestation was asymptomatic.

Anterior segment manifestations are seen in 12.94% of patients with Ocular manifestations. 5 patient had iritis and 2 had Dry eye. Most of these cases were associated with Retinal/choroidal lesions. No case of keratitis was reported in this study.^{6,7}

HIV microangiopathy was the most common retinal manifestation in this study affecting 10% of HIV patients. These patients were asymptomatic and it is not vision threatening. Etiology is due to increased plasma viscosity & Fibrinogen levels, circulating immune complexes or due to direct HIV virus damage to the endothelium.⁶ HAART therapy decreases the prevalence of HIV microangiopathy.

With the decrease in the CD 4 count and increase in age, prevalence of HIV microangiopathy increased in this study which correlates with the previous study.⁸

CMV retinitis was seen in 4% in the total study group. Since the present study was conducted among the patients who were sent for routine ophthalmic checkup from ART centre, The percentage of CMV retinitis in this study was much lower than the previous studies.^{9,10} In one study,⁹ it was conducted in a referral eye centre where most of the patients were symptomatic and already diagnosed and referred to the particular centre. In another study,¹⁰ most of the patients were in AIDS stage, so the chances of Opportunistic infections were higher. All 4 patients were on HAART therapy. Only one patient had CD4 count < 100 cells /mm³. Others had CD4 count >100 cells/mm³.

In the era of HAART, though the incidence of opportunistic infections has come down drastically, CMV retinitis was seen in patients receiving HAART therapy in this study. This is explained by Pakker et al¹¹ that even though the CD4 count increases with HAART therapy, the functional maturity of the immune system is inadequate and it will take atleast 2 years for immune system to recover close to the normal range.

Conjunctivalmicrovasculopathy was seen in 36% of patients and was the common ocular manifestation seen in this study. 19.4% of patients with conjunctivalmicrovasculopathy were associated with HIV microangiopathy. Ocular Surface Squamous Neoplasia (OSSN) was seen in 1 patient. Excision biopsy was done. HPE report confirmed Low grade Verrucous type of Squamous cell carcinoma. Herpes Zoster Ophthalmicus (HZO) was seen in 1 patient. Other manifestations were Allergic conjunctivitis, Acute follicular conjunctivitis, Molluscum of the lid, Blepharitis and Lacrimal fistula.

5. Conclusions

Though the prevalence of ocular manifestations has decreased in the HAART era, sight threatening ocular lesions like CMV retinitis can occur in even if the CD4 count is > 100 cells/mm³ due to incomplete restoration of the immune system. Regular Ophthalmic examination is recommended at least once in 3 months for all the HIV patients on HAART therapy in spite of their CD4 counts. Further studies involving large sample size is advised to assess the ocular manifestations in HAART patients.

6. Source of Funding

None.

7. Conflict of Interest

None.

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