

## Ocular Manifestations In HIV/AIDS

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### Abstract

**Background:** Ocular involvement in HIV infection/AIDS is very common. The severity of these lesions increases as the immune competency decreases, leading to visual impairment.

**Objective:** The purpose of this study was to determine the prevalence and the types of HIV associated ocular conditions and their effect on the vision in patients with HIV/AIDS.

**Methods:** This cross sectional study was based on the patients with HIV infection/AIDS, who were referred to the Ophthalmic OPD, Government general hospital, Kakinada. All the patients underwent a complete ophthalmic examination, which included both anterior and posterior segment evaluation and colour vision assessment.

**Results:** Ocular findings in this study were more common in the Adnexa (50%), followed by posterior segment (43%), anterior segment (32.5%) and neuro ophthalmic manifestations (6.7%) more than one ocular manifestation was present in 44 patients. Both anterior and posterior segments were involved in 28 patients

**Conclusion:** Since ocular manifestations are very common and as they can occur at any time during the course of HIV infection, an awareness on various patterns of the ocular disease and the screening of all the patients with HIV infection/AIDS is a must.

**Key Words:** Ocular Manifestations, HIV, AIDS, ART Centre

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### I. Introduction

The Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) is one of the most feared infectious diseases of the late 20th century. Since its discovery in 1981, AIDS has emerged as a global health problem of extraordinary proportions and an unprecedented emergency. Thirty years after its discovery, the virus has reached virtually every corner of the globe, making a profound impact on contemporary medical practice, public health priorities and on every aspect of modern society.

The latest statistics of the global HIV and AIDS epidemic published by UNAIDS, WHO and UNICEF in Nov 2014 estimated that 34 million people were living with HIV/AIDS [1]. India has a large number of patients with AIDS, which is the third largest population of this group in the world. According to a report which was made by the National AIDS Control Organization, it has now been estimated that around 2.39 million people in India are living with HIV [2].

HIV causes a wide spectrum of diseases and it is undoubtedly a multisystem disorder, but the ophthalmic disease does affect 70-80% of the patients with HIV infection sometime during the natural history of their infection. Various studies have demonstrated that 40-45% of the HIV infected patients do have some or the other ophthalmic manifestations when they are examined by an ophthalmologist [3]. The spectrum of the HIV associated ophthalmic disease is very broad and it ranges from 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 immunocompetency 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.

Since the first report on the ocular manifestations of AIDS which was made by Holland et al., in 1982 [4], subsequent studies have described several AIDS related conditions in the eye and the orbit [3,5]. Ocular manifestations of HIV in India was first reported in 1995 [6]. Since then, the number of HIV patients has greatly increased. The estimated prevalence of HIV related eye diseases in India is reported to be between 8-45 % [5-9].

### II. Materials & Methods:

104 Patients with HIV/AIDS, who had registered at the ART Centre, were referred to the Ophthalmic OPD for a complete ocular examination. An epidemiological study of these patients was conducted in order to analyze the prevalence and the nature of the ocular lesions and their effect on the vision in HIV infected/AIDS patients from East Godavari district. The patients who belonged to all the age groups, those with both high and low CD4 counts and the patients who were in the asymptomatic carrier state to those with full blown AIDS, were included in the study. A complete ocular examination of both the eyes was done, which included the

assessment of the distant visual acuity by using Snellen’s chart and near vision assessment which was done by using Jaeger’s chart. Refraction was done and the best corrected visual acuity was estimated. Colour vision was assessed by using Ishihara’s chart. Anterior segment examination was done by using a slit lamp biomicroscope and the intra ocular pressure measurement was done. Fundus examination was done by using an indirect ophthalmoscope and +90D biomicroscopy. Standard 45 degree fundus photographs were taken in the presence of posterior segment findings. Attention was given to the presence of any lid retraction and pupillary abnormalities. These patients were followed up every 3 months. Early follow up was indicated in the presence of ocular manifestations, the presence of ocular symptoms and in those with low CD4 counts. However, most of the patients were inconsistent or lost for follow up.

**III. Observations & Results**

A Total of 104 patients who are HIV Seropositive in various stages of infection were evaluated comprising of 73 male ( 70.2%) and 31 female (29.8%)patients .

**TABLE : 1 AGE DISTRIBUTION**

AGE GROUP	MALES	FEMALES
0 – 14 Yrs	2	1
15 – 29 Yrs	29	12
30 – 49 Yrs	37	16
> 50 Yrs	5	2

One hundred and four patients were examined. The mean age of the study patients was 32 years. Majority of the patients 94 (90.38%) were in the age group between 15- 49 years, of which most of the patients 53 (50.96%) were in the age group of 30-49 years with 37 males (35.57%) and 16 females (15.39%) The youngest patient was a child aged 12 years of age and the oldest patient was of 56 years of age.

Out of 104 patients 93 (89.4%) were married and 21(10.6%) were unmarried. Out of 93 married patients, 66 (70.9%) are males and 27 (29.1%) are females. Out of the 66 HIV positive males, 10 patients also had their wives positive for HIV. out of the 27 females who are positive for HIV , 13 had their husbands also positive for HIV. Out of 93 married patients, 59 had children out of which 11 were HIV +ve and 48 are HIV –ve. Of the 11 unmarried HIV positive patients 7 (63.6%) were males and 4 (36.4%) were females.

HIV was predominantly seen in labourers 40 (38.46%), drivers 22 (21.15%), Commercial sex workers 19 (18.29%), businessman 14 (13.33%), Housewives 6(5.76%) and students 3 (2.88%).

The predominant mode of transmission of sexual (Hetero sexual) transmission. It is seen in 91 (87.5%) of patients, 4 (3.4%) patients has History of IDU, 3 (2.88%) patients has History of blood transfusion, 6 (5.76%) patients did not revealed the History of risk factor for AIDS.

HIV infection was predominantly seen in uneducated patients 64 (61.5%). 44 (42.3%) Males and 20 (19.3%) females were illiterates in the present study. 10 (9.6%) patients who are graduates(6.7%) and post graduates(2.8%) also incurred the disease.

**TABLE :2 OCULAR MANIFESTATIONS OF HIV +VE PATIENTS**

No. of HIV +ve cases - 104 patients  
 Ocular manifestations are seen in - 72 patients  
 % of patients with ocular manifestations - 69.23%

Sl.no	OCULAR MANIFESTATION	No of cases	% of cases
1	ADNEXAL MANIFESTATIONS	54	50%
2	ANTERIOR SEGMENT LESIONS	35	33.6%
3	POSTERIOR SEGMENT LESIONS	44	42.3%
4	NEURO-OPHTHALMIC LESIONS	7	6.7%

Total No. of ocular findings in 72 patients are 150 (adnexal lesions – 54, anterior segment – 35, posterior segment -44, neuro ophthalmic manifestations- 7 ) and more than one ocular manifestation was present in 44 patients. Both anterior and posterior segments were involved in 28 patients.

**TABLE :3 OCULAR ADNEXAL LESIONS**

SL.NO	ADNEXAL LESIONS	NO OF CASES	%
1	NORMAL	52	50
2	BLEPHARITIS	6	5.7
3	MEIBOMITIS	3	2.8
4	CONJUNCTIVITIS	16	15.3
5	C. MICROVASCULOPATHY	18	17.3
6	MOLLUSCUM CONTAGIOSUM	2	1.9
7	OSSN	2	1.9
8	KAPOSIS SARCOMA	1	0.9
9	HZ OPHTHALMICUS	4	3.9

Ocular Adnexal lesions involving the eye lids,conjunctiva, periorbital regions are seen in 40.4% of HIV positive patients . conjunctivitis (15.3%)and conjunctival microvasculopathy (17.3%) are the most common (65 %) adnexal lesions . Blepharitis (5.7%) and Meibomitis (2.8%) account for 17.3% of adnexal lesions. Herpes zoster ophthalmicus (3.9%) account for 7.6% of adnexal lesions .Molluscum contagiosum(1.9% ),Ocular Surface Squamous Neoplasia (1.9%) and Kaposis sarcoma (0.9%) are less common causes of adnexal lesions.

**TABLE : 4 ANTERIOR SEGMENT LESIONS**

SL.NO	ANTERIOR SEGMENT LESIONS	NO OF CASES	%OF DISEASE
1	NORMAL	69	66.3
2	DRY EYES (KCS)	8	7.7
3	CORNEAL ULCER	5	4.8
4	H.S.KERATITIS	6	5.7
5	ANTERIOR UVEITIS	14	13.5
5	COMPLICATED CATARACT	2	1.9

Anterior segment lesions are seen in 34.7% of patients. Iridocyclitis (acute and chronic ) in 13.5% of patients accounting for (40%) of anterior segment lesions is the commonest anterior segment lesion. Keratoconjunctivitis sicca (7.7%) is the second most common lesion. corneal ulceration is seen in 4.8%,herpes simplex keratitis in 5.7% and Complicated cataract in 1.9% of patients are the other common lesions.

**TABLE : 5 POSTERIOR SEGMENT LESIONS**

SL.NO	POSTERIOR SEGMENT LESIONS	NO OF CASES	%OF DISEASE
1	NORMAL	59	56.7
2	COTTON WOOL SPOTS	18	17.3
3	CMV RETINITIS	12	11.5
4	TOXOPLASMA CHORIORETINITIS	5	4.8
5	RETINAL DETACHMENT	2	1.9
6	ACUTE RETINAL NECROSIS	2	1.9
7	VITRITIS	6	5.7

Posterior segment lesions are seen in 43.3% of patients. Retinal microvasculopathy (17.3%) with cotton wool spots and Cytomegalovirus retinitis (11.5%) account for 68 % of the posterior segment lesions. vitritis(5.7%), chorioetinitis (4.8%) ,retinal detachment (1.9%),acute retinal necrosis (1.9%) are the other common lesions in posterior segment

TABLE : 6 NEURO-OPHTHALMIC LESIONS

SL.NO	NEURO-OPHTHALMIC LESIONS	NO OF CASES	%OF DISEASE
1	NORMAL	97	93.3
2	OPTIC ATROPHY	2	1.9
3	PAPILLOEDEMA	3	2.9
4	PAPILLITIS	2	1.9

Neuroophthalmic manifestations seen in seven patients account for 6.7% of lesions. Papilloedema in 3 patients is the commonest lesion.papillitis and optic atrophy each in 2 patients are the other neuroophthalmic lesions.

#### IV. Discussion

In the present study conducted at Government general hospital Kakinada, a total of 104 patients (73 male and 31 female ) were evaluated for various ocular manifestations and were on follow up and management for HIV/AIDS.

The age range was 12 years to 56 years with a mean age of 32 years. More than 90 % of the patients were in the 25- 44 years age group which is the high risk group for HIV infection. Out of 104 patients the percentage of males affected were 70.19% and 29.80% were females with M : F ratio 2.4 : 1. Male preponderance was due to social and economic freedom and higher degree of promiscuity and therefore increased risk of Acquiring HIV infection. Heterosexual infection (91%) is the commonest mode of transmission.60% of the labourers and drivers incurred the disease.

In terms of level of education 61.5% of the patients are illiterate , 29.8% % had school education. Education not only affects changes in sexual behaviour, but also predicts level of knowledge about the disease. A study based on data from the 1998–1999 National Family Health Survey (NFHS) of India found that the higher the level of education of women, the more likely it is that they will have greater awareness of and accurate knowledge on AIDS<sup>[1,2]</sup>.

It was noted that 69.2% of the patients had some form of ocular manifestations. These findings are close to the results noted by Brewno Rocha Lima (2004) and Yareed etal (2005). Ocular lesions occur in 40-70% of the AIDS patients, according to various studies<sup>[3,4,5]</sup>. The higher prevalence noted in this study is probably due to the fact that 93% of the patients were on anti retro viral therapy and most of the patients (78%) were in stage III and IV as per WHO classification when the infection rate and complications were high and suggested that with improvement of treatment and patients survival, ophthalmic complications are now being seen with increasing frequency in AIDS, occurring in up to 75% of patients during the course of the disease.

Ocular findings in this study were more common in the Adnexa (50%), followed by posterior segment (43%), anterior segment(32.5%) and neuro ophthalmic manifestations (6.7%) more than one ocular manifestation was present in 44 patients<sup>[6,7]</sup>. Both anterior and posterior segments were involved in 28 patients.

This study found Retinal microvasculopathy and CMV retinitis in 29 % of the cases. and Retinal microvasculopathy is the most common posterior segment manifestation in 17 % of the patients followed by CMV retinitis in (11%). This was in agreement with the studies conducted by Jabs et al in the USA who found CMV retinitis in 14% and in 11% presence of cotton wool spots and by Jyotirmay Biswas etal<sup>[23,24]</sup> (1999)at shankara Netralaya, Chennai who found CMV retinitis in 17% and HIV retinopathy in 15%. 4.5% of the patients had Toxoplasma chorioretinitis apparently not related to CMV. CMV retinitis was noted only in patients with a CD4 count of less than 200 while the HIV microangiopathy was noted in CD4 counts of greater than 500. Bilateral CMV retinitis was found in 3 cases.

Adnexal manifestations were present in 50% of our patients and the main findings were conjunctivitis (15%)and conjunctival microvaculopathy in 17% of the patients Herpes zoster ophthalmicus<sup>[13,14]</sup> accounted for 3.5%. Blepharitis (5%), Meibomitis (3%),molluscum contagiosum<sup>[12]</sup> (2%) ,Ocular surface squamous neoplasia<sup>[15]</sup> (2%) and Kaposi sarcoma<sup>[16]</sup> (1%). These lesions are due to the immunosuppression of HIV. Reports indicate that greater than 50% of the HIV infected patients have anterior segment and adnexal manifestations<sup>[10]</sup>

Anterior segment manifestations were seen in 32.5 % of patients, the most notable being iridocyclitis (13.5%),followed by kerato conjunctivitis sicca (Dry eyes) in 7.6% and Herpes simplex keratitis in 5.6% of the patients .Others reported anterior segment manifestations in 53% of the cases<sup>[8,9]</sup> and Jyotirmay Biswas etal (1999) reported anterior segment lesions in 60 % . Most common anterior segment manifestation was recurrent lid infections. Severe blepharitis, styes and lid ulceration may be the initial involvement in AIDS<sup>[11]</sup>.

Posterior segment lesions are seen in 43.3% of patients. Retinal microvasculopathy (17.3%) with cotton wool spots and Cytomegalovirus retinitis (11.5%) account for 68 % of the posterior segment lesions.

vitritis(5.7%), chorioetinitis (4.8%) ,retinal detachment (1.9%),acute retinal necrosis (1.9%) are the other common lesions in posterior segment<sup>[17,18,19]</sup>

Neurophthalmic findings were seen in 7 patients and included optic atrophy (2 patients), papilloedema (3 patients) and papilitis (2patients). Assefa Y et al found neuro-ophthalmologic disorders in 9.6% in their HIV/AIDS patients which is similar to this study<sup>[22]</sup>. Two cases of papilloedema and one case of Papillitis were attributed to Cytomegalovirus retinitis based on the clinical appearance. However, no other specific causes for neuro-ophthalmologic findings could be established.

Systemic manifestations of HIV/AIDS were seen in 62 patients with TB (25%) and Oro-pharyngeal candidiasis (8%) being the commonest. Kumaraswamy<sup>[23,24,25]</sup> et al found TB in 35% of the patients with HIV/AIDS . They noted choroidal granulomas in 3% of patients with systemic TB. No choroidal granulomas were found in this study. There is significant association between systemic diseases and ocular manifestations

In this study most patients were in HIV/AIDS stage III (45%) followed by stage IV (33 %) and stage II (16.5%) and stage I in (5.5%) . Patients in stage IV had the highest prevalence of ocular manifestations (100%) followed by patients in stage III (91.5%). The least prevalence was noted in stage I (66.7%). This relation was statistically significant and suggests that the magnitude of the ocular involvement increases with severity of the HIV/AIDS disease. The higher magnitude of ocular manifestations in stage I demonstrates that ocular manifestations may occur at any CD4 count. Most of the manifestations in this stage were non-blinding. Assefa et al in their study from Ethiopia reported 90% of the patients in clinical stage III and IV. Of these, 60% had at least one ocular manifestation.

CD4+ T lymphocyte counts can be a reliable predictor of ocular complications of HIV infections . This study found that 6 patients with CD4 count less than 100 cells/  $\mu$ l had higher rate (100%) of ocular manifestations predominantly involving both the segments. However the study showed no association between ocular adnexal findings, ocular anterior segment findings and neuro-ophthalmic findings with the level of CD4 count, but demonstrated a positive association between posterior segments findings .

However, there were a few limitations in our study. The follow up findings were not included, as most of the patients were inconsistent or lost for follow up. Other factors like the duration of the HIV infection, any underlying systemic disease and the treatment schedule were not included. The correlation of the CD4+ counts with the ocular manifestations could not be assessed, as the time of the CD4+ count estimation did not coincide with the time of the ocular examination. Since the CD4+ count analysis was not done at the time of the ocular examination, the correlation between these two factors would be inappropriate.

**HERPES ZOSTER OPHTHALMICUS**

**OCULAR SURFACE SQUAMOUS  
NEOPLASIA**



**KAPOSI SARCOMA**



**CORNEAL ULCER :PSEUDOCORNEA**



**NONGRANULOMATOUS IRIDOCYCLITIS**

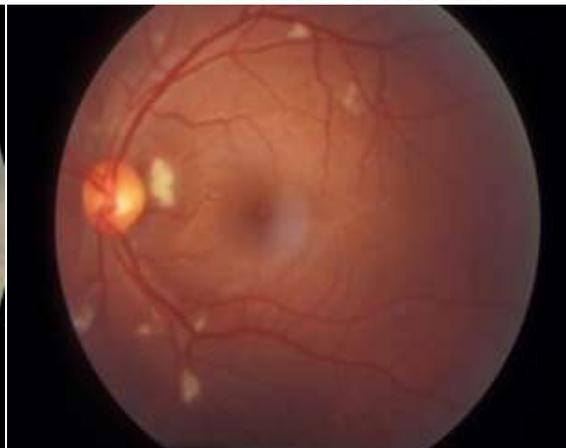
**CHRONIC IRIDOCYCLITIS IRIS BOMBE**



**RETINAL DETACHMENT**



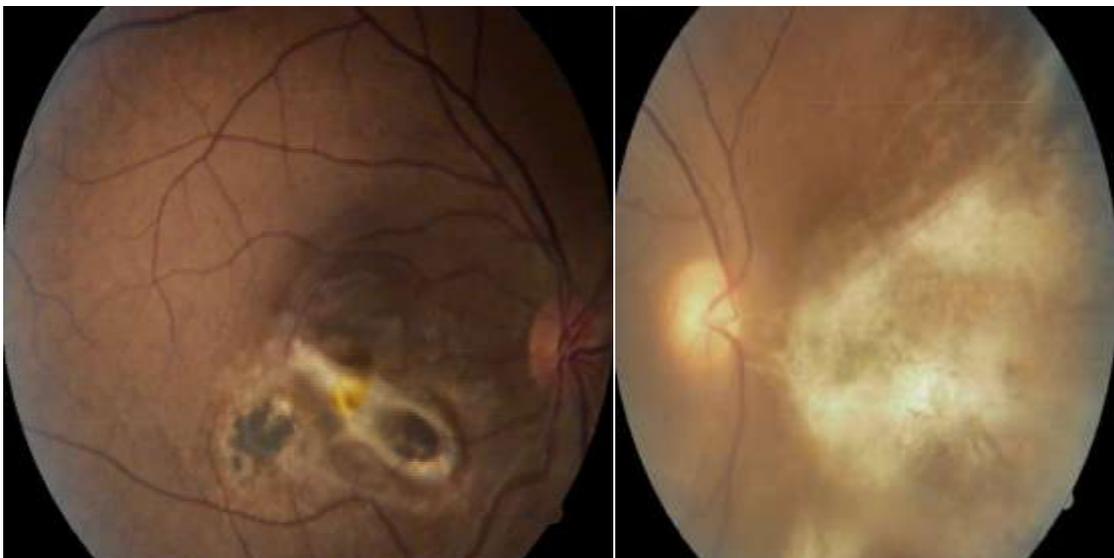
**HIV RETINOPATHY:LEFT**



**PAPILLOEDEMA: BILATERAL**

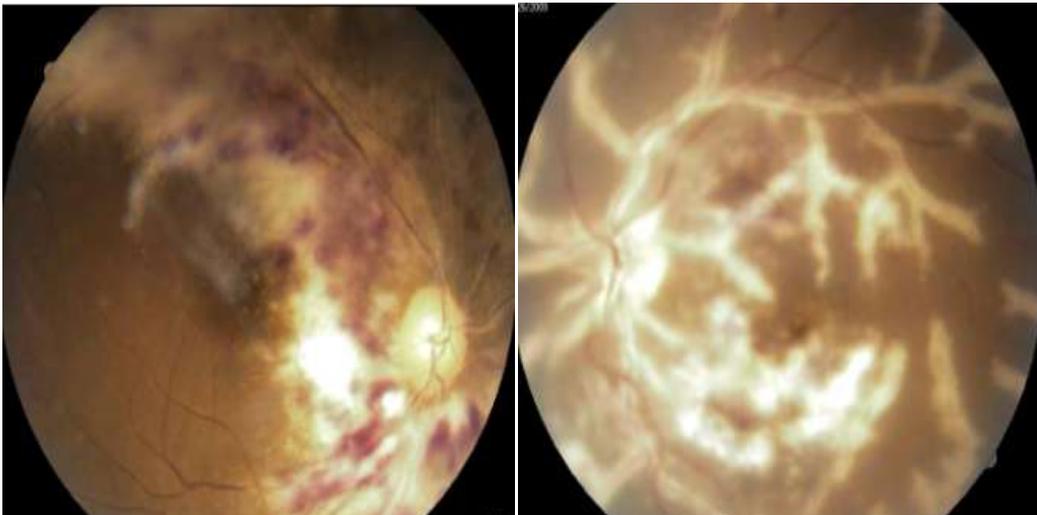


**TOXOPLASMA CHORIORETINITIS:RIGHT    ACUTE RETINAL NECROSIS :RIGHT**



**CMV RETINITIS : RIGHT EYE**

**FROSTED BRANCH ANGITIS :LEFT**



**ESTABLISHED CMV RETINITIS : BOTH EYES****V. Conclusion**

Ocular manifestations are among the most common clinical features in HIV/AIDS patients having various clinical presentations affecting almost all the structures of the eye. Moreover, the ocular findings can be the initial manifestations of the underlying disease. However, diagnosis and management of the ocular diseases in these patients pose a therapeutic challenge to ophthalmologists, due to the atypical disease presentations and the lack of specific investigations which provide a rapid and a reliable confirmation of the clinical diagnosis. Hence, an awareness on ocular lesions in AIDS is important for their early recognition and management. Many of the ocular manifestations may be asymptomatic. Hence, screening for ocular complaints is not a reliable method for identifying those with ocular morbidities. This highlights the need for a routine ophthalmic screening with a complete ocular examination in all HIV/AIDS patients.

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