

# A Study of Ocular Complications of HIV/AIDS in a Teaching Medical College in North-Eastern India.

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## ABSTRACT

**Background:** HIV infection/AIDS is becoming a public health hazard globally. Ocular complications of HIV/AIDS are very common and its severity increases as the disease progresses and ultimately leads to blindness. Objective: The purpose of the present study was to determine the prevalence and type of ocular complications in patients with HIV/AIDS. **Methods:** A cross-sectional study was done on patients with HIV infection/AIDS who attended or referred to eye OPD and also cases from General Medicine ward of JNIMS. A complete ophthalmic evaluation of both anterior and posterior segments was conducted. HIV sero-positivity was established by ELISA and confirmed by Western Blot in all cases. **Results:** The majority of the patients were in the age group of 21-40yrs. The prevalence of ocular involvement was 47%. The commonest involvement was on posterior segment with HIV retinopathy and cotton wool spots (20%) and CMV retinitis (5%). Anterior segment involvement was 18% with conjunctival micro-vasculopathy being the commonest (8%) and HZO in 5 cases. **Conclusion:** HIV infection is fairly common in Manipur among the age group of 20-40yrs., IDU being the commonest route of infection. Ocular involvement occurred in 47% of cases and it may be the first manifestation. So, the ophthalmologist must be aware for prompt treatment and prevention of visual disabilities.

**Keywords:** Acquired Immunodeficiency Syndrome (AIDS), CD<sub>4</sub><sup>+</sup> cell count, Cotton Wool Spot (CWS), Cytomegalovirus (CMV), Human Immunodeficiency Virus (HIV).

## INTRODUCTION

Acquired Immunodeficiency Syndrome is a potentially fatal multisystem syndrome caused by infection with a retrovirus, the human immunodeficiency virus (HIV). It is characterised by a gradual decrease in the circulating CD<sub>4</sub><sup>+</sup> T-lymphocytes count and thereby leading to severe immune depression and subsequent development of various opportunistic infections.<sup>[1]</sup> AIDS was first described in Los Angeles, USA, and within three years the causative virus HIV was identified.<sup>[2,3]</sup> HIV infection in India was reported in May 1986 from commercial sex workers.<sup>[1,4-6]</sup> Currently it is estimated that about 3.86 million people are affected in India and globally approximately 36.7 million people are living with HIV resulting to around 1 million deaths per year.<sup>[7]</sup>

HIV was first detected in the state Manipur in 1990 among Intravenous drug users (IVDUs). The cumulative number of people living with HIV/AIDS

as on 31st March 2013 is 23,370 with 1,552 children as on 31st March 2013 is 23,370 with 1,552 children with HIV/AIDS. Intravenous drug use was the most common route of transmission of HIV in Manipur but there has been a steady decline in HIV/AIDS among IVDUs.<sup>[8]</sup>

Manipur has a population of 2721,758 as per 2011 census (approx. 0.2% of India's population) with a sero-positivity rate of 8.02 per 100 samples screened. The total number of AIDS cases was 4,724 and total number of death due to AIDS as of January 2011 was 685.<sup>[8,9]</sup>

In spite of widespread use of highly active anti-retroviral therapy (HAART), ocular lesions occur in as many as 75% of patients with HIV.<sup>[5,10-12]</sup> It can involve almost all parts of the eyeball and can be the initial manifestation. Ever since the first description on ocular manifestation of AIDS was made by Holland et al in 1982 several reports have been published on ocular involvement in AIDS in different part of the world.<sup>[4,13-22]</sup> In India the eye abnormalities in HIV infected patients was first reported in 1995 from Chennai.<sup>[1,5,10,11]</sup> The estimated prevalence of HIV-related eye diseases in India is reported to be between 8-45%.<sup>[5-7,21,22]</sup> Ocular adnexal lesion is seen in about 25% of patients and can be a sign of severe systemic immune-suppression.<sup>[23]</sup> The spectrum of ocular

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lesion of AIDS in the developing world differs from that of developed nations.<sup>[24]</sup> Considering the high sero-positivity rate in the state of Manipur and the variability of the ocular manifestations the study was felt important.

### **Aims & objectives**

The present study was done to find out the prevalence of ocular complications of HIV/AIDS and describe them.

## **MATERIALS AND METHODS**

A cross-sectional study was conducted among all patients who were diagnosed of having HIV-infection/AIDS (established by ELISA and confirmed by Western Blot in all cases). Patients of all ages who attended or referred to eye OPD and also cases from General Medicine ward of the Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Imphal during March 2014 to March 2017 were included in the study.

After obtaining informed consent, detailed information on socio-demography and risk-behaviours was collected from all the study-subjects by using a semi-structured questionnaire. Following this all of them were given a complete ocular examination of both the eyes. Distant visual acuity was taken by using Snellen's vision chart and near vision assessment was done by using Jaegers chart. Best corrected visual acuity was estimated by refraction. Anterior segment examination was done using slit lamp biomicroscope and the intraocular pressure was measured by Non-contact tonometer. Colour vision was tested by using Ishihara's chart. Fundus examination was done by using both Direct and Indirect ophthalmoscope with +90D lens. Fundus photographs were taken for posterior segment lesions. Examination of eyelids, eyelashes, ocular motility and corneal sensitivity were carried out. Systemic examinations of these patients were also done and relevant radiological and laboratory investigations were carried out.

The data thus collected were analyzed and are presented by using descriptive statistics like mean, standard deviation and proportions.

## **RESULTS**

**Table 1: Age & gender distribution of the study-subjects (n=100)**

Age-group (yrs.)	Male	Female	Total
0-10	02	01	03
11-20	06	00	06
21-30	33	06	39
31-40	36	07	43
≥ 41	06	03	09
Total	83	17	100

A total of 100 HIV sero-positive patients (83 males and 17 females) in various stages of infection took

part in the study. The age-range was 5-45 years with a mean age (SD) of 30±5 years. More than three-fourths of the patients (82%) belonged to the productive age group of 21-40 years. [Table 1] More than half (55%) of the patients were from the urban areas and by religion the majority of the patients were Hindus (82%). The commonest mode of HIV infection was injecting drug-user (52%) followed by the sexual route (40%). [Table 2]

**Table 2: Distribution of study-subjects by mode of HIV transmission (n=100)**

Mode of transmission	No. of patients	Percentage
Injecting Drug Users (IDUs)	52	52
Sexual	40	40
Perinatal	2	2
Blood transfusion	2	2
Others	4	4

Nearly half of all the study-subjects (47; 47%) were found to have ocular lesion at the time of examination. More than one ocular lesion could be detected in some patients. The number of ocular manifestations seen in these 47 patients was adnexal lesion (23), anterior segment lesion (18), posterior segment lesion (28) and neuro-ophthalmic lesion (4) indicating that posterior segment lesions, adnexal lesions and anterior segment lesion were the very common manifestations. The specific structures affected are detailed in [Table 3].

**Table 3: Distribution by segment & structures involved (n=47)\***

Segments	Structures	No. of patients*	Total (%)
Adnexal lesion	Blepharitis	4 (4%)	23
	Conjunctivitis	5 (5%)	
	Conjunctival micro-vasculopathy	8(8%)	
	Herpes Zoster	5 (5%)	
	Ophthalmicus	1 (1%)	
	Molluscum contagiosum		
Anterior segment	Anterior Uveitis	5 (5%)	18
	Keratoconjunctivitis sica (Dry eye)	6 (6%)	
	Complicated cataract	3 (3%)	
	Glaucoma	2 (2%)	
	Corneal ulcer	2 (2%)	
Posterior segment	Cotton Wool Spot	20 (20%)	28
	CMV retinitis	5 (5%)	
	Chorioretinitis	2 (2%)	
	Enophthalmitis	1 (1%)	
Neuroophthalmic lesion	Papilledema	2 (2%)	4
	Papillitis	1 (1%)	
	Optic atrophy	1 (1%)	

\* Multiple segment and ocular structures affected in some patients.

Adnexal lesions involving eyelid and conjunctiva were seen in 23% of HIV/AIDS patients. Conjunctival micro-vasculopathy and conjunctivitis were the common adnexal lesions. Herpes Zoster Ophthalmicus occurred in five cases with the youngest patient affected being boy of 5 years only.

This particular boy had Herpes zoster ophthalmicus, enophthalmitis, retinopathy, retinitis as well as cotton wool spots (Photograph 1a-e). Blepharitis was seen in only 4% of cases and molluscum contagiosum in one case only. [Table 3]



**Figure 1a: Herpes zoster ophthalmicus, 1b: Enophthalmitis, 1c: HIV retinopathy, 1d: CMV retinitis, 1e: Cotton wool spots.**

Anterior segment lesion was seen in 18% of cases. Keratoconjunctivitis sicca (6%) and anterior uveitis (5%) were the most common anterior segment lesions. Corneal ulcer was seen in 2 cases, complicated cataract in 3 cases and glaucoma in 2 cases. Posterior segment lesion (28%) was the most common lesion followed by adnexal lesion (23%). The most common posterior segment lesion was cotton wool spot (CWS) in 20%, followed by cytomegalovirus retinitis in 5%. Other lesions seen were nonspecific chorioretinitis in 2% and enophthalmitis in 1%.

Neuro-ophthalmic manifestations were seen in 4% of cases, papilloedema in 2%, papillitis in 1% and optic atrophy in 1%.

Regarding associated systemic diseases pulmonary tuberculosis was the most frequently associated illness (25%) while other associated illness were oropharyngeal candidiasis (17%), pneumocystis carinii pneumonia (12%), cerebral toxoplasmosis (7%), cryptococcal meningitis (5%) and hepatitis B (2%). [Table 4] Kaposi's sarcoma was not observed in any one of the study-subjects.

**Table 4: Associated systemic diseases**

Systemic Disease	No. of pts.	Percentage
Pulmonary tuberculosis	25	25
Oropharyngeal Candidiasis	17	17
Pneumocystis carinii pneumonia	12	12
Toxoplasmosis	7	7
Cryptococcal meningitis	5	5
Hepatitis B	2	2

## DISCUSSION

The present study showed a comparatively lesser ocular involvement in HIV/AIDS than other previous studies. Earlier studies showed a prevalence

of 63% in USA and 55% in Africa.<sup>[25]</sup> According to various studies ocular lesions occur in 40-70% of the AIDS patients.<sup>[26,27,28]</sup>

The male preponderance of the study subjects in the current study may be because of their increased risk behaviour compared to females in the study area.

In this study we found posterior segment lesion as the commonest ocular complication (28%) followed by adnexal lesion (23%), anterior segment (18%) and neuro-ophthalmic lesion (4%). In some patients more than one manifestation were present. This finding corroborates with earlier study findings.<sup>[15,16]</sup>

Retinal vasculopathy manifesting as cotton wool spots (CWS) was the commonest posterior segment manifestation (20%) followed by cytomegalovirus retinitis (5%). This finding is comparable with the study finding made Jab et al, USA and Biswas J et al.<sup>[23,24]</sup> In other studies also CWS was detected in 25-50% of patients with advanced HIV disease and is regarded as the earliest consistent finding in HIV retinopathy.<sup>[19,20]</sup>

CMV retinitis was very common before HAART amongst the AIDS patients. With the introduction of HAART its incidence has declined markedly but still remains as the leading cause of ocular morbidity in the developing world.<sup>[21-23]</sup> Prior to the AIDS epidemic, CMV retinitis was a rare disease. With the rapid spread of HIV/AIDS it has become a common intraocular infection amongst the AIDS patients with CD4<sup>+</sup> T lymphocyte count less than 50 cells/mm.<sup>[3,16,29,30]</sup> Clinically CMV retinitis is usually seen 9-15 months after diagnosis and indicates poor prognosis of HIV/AIDS patients. In our study CMV retinitis was detected only in 5% of HIV infected patients. This finding is relatively low in comparison to other studies.<sup>[31,32]</sup>

Toxoplasma chorioretinitis was seen only in 2% of patients. It may cause a variety of ocular abnormalities.<sup>[33]</sup> Toxoplasma chorioretinitis is relatively rare and accounts for 1% of AIDS patients.<sup>[34]</sup>

Adnexal lesion (24%) was found to be the second most common manifestation in our study. Conjunctival micro-vasculopathy (8%) was the commonest adnexal lesion seen followed by conjunctivitis (5%), HZO (5%) and molluscum contagiosum (1%). In an earlier study adnexal lesion could be seen in up-to 50% of the cases.<sup>[35]</sup> The incidence of HZO in the HIV population as reported by another study is 5-15%.<sup>[36]</sup> HZO with hemorrhagic hypopyon may be the initial feature of AIDS.<sup>[37]</sup> It usually occurs in elderly patients. Any patient under the age of 50 years who develop HZO should be tested for HIV. HZ infection in face or neck was found to be commonly associated with AIDS.<sup>[22,26]</sup>

Conjunctivitis was in 5% of cases in our study. Another study shows nonspecific culture -ve conjunctivitis in 10% of patients with HIV.<sup>[13]</sup> Molluscum contagiosum was seen in only 1% of

cases in our study. It may be seen in 5% of HIV infected cases and more severe in HIV +ve individuals.<sup>[38,39]</sup> The discrepancy in the percentages may be because of the low sample studied in the present study.

In this study we did not find any case of Kaposi's sarcoma although available literature shows that it occurs in 30% of AIDS patients in USA but very rare in Indian subcontinent due to the rarity of the causative agent human herpes virus 8<sup>[22]</sup>. This fact might explain this phenomenon.

Anterior segment lesion occurred in 15% of cases in our study. Keratoconjunctivitis sicca (KCS) or dry eye (6%) was the commonest anterior segment lesion found followed by anterior uveitis (5%). An earlier study found KCS occurring in 20-38.8% of HIV +ve Patients.<sup>[40]</sup> HAART has no role in reducing the prevalence of KCS.<sup>[38]</sup> We did not find posterior or panuveitis in this study but Cunningham ET Jr. found anterior uveitis to be less common than posterior or panuveitis.<sup>[41]</sup>

Neuro-ophthalmic lesions were seen in 4% of cases which comprised of papilloedema, papillitis and optic atrophy. Studies done earlier shows that neuro-ophthalmic complications can occur in 10-15% of HIV infected patients.<sup>[42,43]</sup>

## CONCLUSION

HIV is fairly common in the state Manipur among the age group of 20-40 years and highest among the IDUs. Ocular involvement occurs in 47% of cases and pulmonary tuberculosis was the commonest systemic infection associated with HIV/AIDS. Low CD4<sup>+</sup> count is a good predictor for CMV retinitis and posterior segment manifestation.

Although in this era of HAART the prevalence of ocular opportunistic infection is decreasing, ocular manifestations are still common clinical feature in HIV/AIDS patients and can be the initial manifestation. Therefore, ophthalmologists must be aware of the initial ocular manifestations of HIV/AIDS for prompt treatment and prevention of visual disability. Their role in the management of HIV positive patients is becoming increasingly important. CMV retinitis remains the leading cause of vision loss in HIV positive individuals. HAART has been shown to cause regression and reduce incidence of CMV retinitis and also prolong the survival of patients.

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