

## OCULAR MANIFESTATIONS IN HIV AND AIDS INDIVIDUALS AT SAROJINI DEVI EYE HOSPITAL, HYDERABAD

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**ABSTRACT: AIM:** To study the ocular manifestations in HIV patients. **METHODS:** A prospective study was undertaken at Sarojini Devi Eye Hospital, Hyderabad, from October 2012 to September 2014. One hundred HIV positive patients were studied of which 67 showed ocular lesions. All the enrolled patients underwent thorough systemic and ocular examination including HIV tests. **RESULTS:** 67% of the patients had ocular lesions. Cotton wool spots were commonest followed by CMV retinitis, anterior uveitis, HZO and herpetic infections, corneal ulcer, dry eyes and Toxoplasma. **CONCLUSIONS:** Tiny retinal hemorrhages and cotton wool spots were the earliest signs of infections and were detected during routine fundus examination. Anterior uveitis, HZO, CMV retinitis was the characteristic features in this study.

**KEYWORDS:** HIV, HZO, CMV retinitis, Cotton wool spots.

**INTRODUCTION:** Acquired immunodeficiency syndrome (AIDS) is an infectious disease caused by a retrovirus, the human immunodeficiency virus (HIV).<sup>(1)</sup> It is a potentially lethal multisystem disorder. Since its discovery, AIDS has emerged as a global health problem of extraordinary proportions and unprecedented emergency.

The acquired immune deficiency syndrome (AIDS) was first recognized in the United States in the summer of 1981, when the centre for disease control and prevention reported the unexplained occurrence of pneumocystis carini pneumonia in previously healthy homo sexual men in Los Angeles<sup>(2)</sup> and of kaposi's sarcoma in previously healthy homo sexual men in New York and Los Angeles. In 1983 human immuno deficiency virus (HIV-1) was isolated from a patient with lymphadenopathy and 1984 demonstrated it clearly as the causative of AIDS.

HIV - II was first identified in 1986 in West African patient was originally confined to West Africa (Clauvel et al-1986).

HIV Virus belongs to the Lenti Virus, sub group of retrovirus which cause slow infection (Latib, Lenti- slow) with long incubation periods. Two recognized human retroviruses, which are cytopathic viruses that produce AIDS<sup>1</sup> are:

1. Human Immune deficiency virus -1 (HIV-1).
2. Human Immune deficiency virus -2 (HIV-2).

HIV infection/ AIDS is a global pandemic, with cases reported from virtually every country. It is a potentially lethal multi system disorder.<sup>4</sup>

First case in India was reported from madras in 1986 from a commercial sex worker.<sup>(3)</sup> First case in Andhra Pradesh, a microbiologist diagnosed as HIV/AIDS case at USA died at Hyderabad at Fever Hospital (Institute of Tropical Diseases) in 1987.

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Amongst the numerous symptoms of HIV disease ocular manifestations remain one of the most important clinical markers. Ocular lesions associated with AIDS in India were first reported in 1995.

Ocular involvement in AIDS is as high as 40%-70%. Ocular lesions are varied and affect almost all structures of the eye.<sup>(4)</sup> However, posterior segment lesions are the most common and of these, HIV retinopathy and cytomegalovirus retinitis predominate.

### AIMS AND OBJECTIVES:

1. To determine the prevalence and occurrence of ocular diseases in HIV.
2. To establish the various manifestations of the HIV disease and to create awareness about the importance of these manifestations amongst the clinicians.

**Ocular Manifestations of HIV/AIDS:** The role of ophthalmologist in the diagnosis and management of AIDS is becoming increasingly important. Not only does the eye reflect systemic disease, but ocular involvement may often precede systemic manifestations.

The eye is the most common organ affected due to AIDS. Ocular involvement in AIDS is about 50-70%. Ocular lesions are varied and affect almost all structures of the eye.

### The ocular lesions associated with AIDS can be categorized into 4 main groups:<sup>(5)</sup>

1. Non-infectious retinal microangiopathy.
2. Opportunistic infection caused by viruses, bacteria, protozoa and fungi.
3. Unusual neoplasms such as Kaposi's sarcoma and Burkitt's lymphoma
4. Neurophthalmic lesions

### THE TABLE BELOW PROVIDES COMMON OCULAR LESIONS IN VARIOUS PARTS OF THE EYE:<sup>(6)</sup>

a)	Herpes zoster ophthalmicus (HZO)
b)	Kaposi's sarcoma of eyelids, conjunctiva
c)	Molluscum contagiosum of the eyelid
d)	Conjunctival microvasculopathy
e)	Pyohenic infection of eyelid and adnexa
f)	Allergic or infective conjunctivitis
<b>Common ocular adnexal lesions in AIDS patients</b>	

a)	Dry eye
b)	Infective keratitis (Varicella zoster, herpes simplex, microsporidia)
c)	Anterior uveitis
d)	Cidofovir induced
e)	Rifabutin induced
f)	Spill over from cytomegalovirus retinitis
g)	Herpes zoster ophthalmicus (HZO)
<b>Common anterior segment lesions in AIDS patients</b>	

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a)	HIV retinopathy
b)	Cytomegalovirus retinitis
c)	Progressive outer retinal necrosis
d)	Acute retinal necrosis
e)	Herpes zoster retinopathy
f)	Pneumocystis carinii choroidopathy
g)	Ocular syphilis
h)	Fungal endophthalmitis (Cryptococcus, candida)
i)	Mycobacterial infection
j)	Toxoplasmic retinochoroiditis
Common posterior segment lesions in AIDS Patients <sup>(7)</sup>	

a)	Burkitt's lymphoma
b)	Orbital cellulitis (aspergillus)
Common orbital lesions in AIDS patients <sup>(8)</sup>	

a)	Cranial nerve palsies
b)	Papilloedema
c)	Headache
d)	Retro orbital pain
e)	Optic neuropathy
Common neurophthalmic lesions in AIDS patients	

**Adnexal and anterior segment lesions:** HIV infections affecting the ocular adnexa and anterior segment have been reported to occur in 50% of cases. Patients with CD4+T cell count less than 200 cells/ cumm approximately 80%of patients die as a result of an infection other than HIV.

### i) PROTOZOAL INFECTION:

- a. **Pneumocystis Carini:** 70%-80% of patients are affected; usually those with < 200 CD+T cell count.
- b. **Cryptosporidium Parvum:** usually presents as diarrhea-intermittent or continuous.
- c. **Toxoplasma Gondii:** Usually occurs late in course of disease and accounts for 50%-60% of all mass lesions in CNS of HIV positive patients. It is second leading cause of seizures after ADC (AIDS Dementia Complex). Patients present with history of fever, headache and focal neurologic deficits like hemiparesis or aphasia. CT scan picks up the lesions easily and may also show cerebral edema.
- d. **Other Protozoal Infections Include:** Microsporidia, E.histolytica, Visceral leishmaniasis, Isopora belli and G. lamblia.

## BACTERIAL INFECTIONS:

- e. **Mycobacterial infections:** are the commonest secondary bacterial infections in HIV patients. A typical mycobacterium predominates in western world, whereas *M. tuberculosis* is rampant in India. HIV infection increases the risk of developing active tuberculosis by 15-30 times.
- f. **Non-Mycobacterial Infection:** Streptococcus pneumonia, Pneumococcus, Enteric organism-salmonella, shigella, campylobacter, Haemophilus influenza and Staphylococcus.
- g. **Syphilis:** Treponema pallidum is a co-factor in the transmission of HIV. Serological diagnosis could be a problem since HIV positive patients may have false positive VDRL. On the other hand, concomitantly infected patients may not become VDRL positive till late stages due to immunodeficiency.

## ii) FUNGAL INFECTIONS:

- a. **Candida:** Oral thrush is an early manifestation when as candida esophagitis, tracheitis bronchitis or pneumonia occur in advance cases (<100 CD4 + T cell count). Severe forms are AIDS defining illnesses.
- b. **Cryptococcus neoformans:** second most common after candidiasis and the prime cause for meningitis occurring in fairly advanced stage of illness. After a definitive diagnosis of Cryptococcus infection the life span of the patient is barely 9 months. Patient presents with fever (100%), nausea/ vomiting (40%), headache, altered sensorium and signs of meningitis.
- c. **Other fungi:** Histoplasma capsulatum and Coccidioides immitis.

## iii) VIRAL INFECTION:

- a. **Herpes simplex virus:** usually in the form of recurrent orolabial, genital and/ or perianal lesions. Lesions become severe intractable and occur frequently as disease advances. Lesions appear briefly red and are extremely painful.
- b. **Herpes zoster ophthalmicus (HZO):** is caused by the varicella-zoster virus and involves the ophthalmic distribution of the trigeminal nerve. Its occurrence below 50 years of age should arouse suspicion of immunosuppression. Reported incidence in HIV population is 5%-15%.
  1. **Clinical Features:** Dermal involvement heralded by headache, malaise, fever and chills followed by neuralgia 24-48 hrs, later and 2-3 days after that by hyperemic, hyperesthetic edema of the involved dermatome with multiple crops of watery blisters. Treatment consists of IV Acyclovir (10 mg/kg BW TID X 7 days) followed by oral maintenance regimen (800 mg 3-5 times a day). Other drugs are – Famciclovir – 500 mg; IV Fosarnet.
  2. **Molluscum Contagiosum:** Most severe in HIV individuals caused by a large DNA Pox virus. The characteristic skin lesions show a small elevation with central umbilication. In AIDS patients, these lesions are numerous and bilateral. Treatment – electro cautery, chemical cautery, cryotherapy and surgical excision.
  3. Lid infections such as severe blepharitis, style and lid ulceration, abscess may also be initial manifestation of AIDS. Treatment–topical and systemic antibiotics with lid hygiene.

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4. **Conjunctival Microvasculopathy:** 70% -80% patients of AIDS have some form of asymptomatic conjunctival microvascular changes. This includes irregular caliber and course of vessels, microaneurysms, telangiectasia, segmental vascular dilatation and narrowing and sludging of the blood columns.
5. **Keratoconjunctivitis Sicca:** In 10%-20% of HIV positive individuals, Rx- Artificial tear substitute and lubricating ointments.
6. **Infectious Keratitis:** Viral keratitis is more common though fungal keratitis is not uncommon. Recurrence is more common in Varicella zoster virus keratitis and herpes simplex keratitis. Treatment – Oral Acyclovir 400mg, 5 times a day or Famciclovir 125-500 mg 3 times a day. Diffuse superficial punctuate keratopathy associated with conjunctivitis may be caused by microsporidia.  
**Treatment:** Topical fumagillin, propamidine isethionate and oral itraconazole or albendazole.
7. **Anterior-uveitis<sup>17</sup>:** Occurs in 70%-80% of untreated HIV infected patients. However it is less common than posterior or panuveitis.
8. **Kaposi's Sarcoma of Eyelid and Conjunctiva:** is rare in Indian subcontinent due to low prevalence of human herpes virus 8. The lesions are purple-red to bright red, highly vascular with surrounding telangiectatic vessels  
**Treatment-Surgical** excision (If lesion is small), cryotherapy, radiotherapy and chemotherapy.
9. **Neuro Ophthalmic Complications:** Occur in 10%-15%. Non-viral infections including toxoplasmosis and Cryptococcus are common. Cryptococcal meningitis can present as papilloedema with peripapillary retinal hemorrhages, optic atrophy and ophthalmoplegia.
10. **Posterior Segment Lesions:** Most common ocular manifestations due to HIV per se are cotton wool spots and retinal microvascular changes.<sup>(9)</sup>

**HIV MICROVASCULOPATHY:** The most commonly encountered ocular finding in patients with AIDS is microvasculopathic (50%-70%) changes. Earliest and most consistent finding. It is a non-infectious micro vascular disorder.

### OTHER MANIFESTATIONS INCLUDE:

1. ACUTE RETINAL NECROSIS.
2. PROGRESSIVE OUTER RETINAL NECROSIS.
3. SQUAMOUS CELL CARCINOMA OF CONJUNCTIVA AND EYELID.
4. B CELL LYMPHOMA OF CNS AND RETINA.
5. EXTRAOCULAR MUSCLE PALSY.

**MATERIAL AND METHODS:** Study was conducted at Sarojini Devi Eye Hospital, Hyderabad from October 2012 - September 2014. Study comprises of 100 HIV patients.

**INCLUSION:** Patient screened for HIV in the ophthalmology department and patients screened from other departments with HIV positive status also were included.

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**EXCLUSION:** Terminally ill patients who could not be screened for ocular manifestations.

**OBSERVATIONS AND RESULTS:**

Age (Yrs)	Number of HIV Cases	
	Males	Females
1-10	1	1
11-20	3	2
21-30	38	12
31-40	19	5
41-50	9	2
51-60	8	0
	78	22

**Table 1: Age and Sex distribution  
Total Number of case – 100**

CATEGORY	Number of patients
Labourers	47
House wives	15
Drivers	14
Students	4
Business Men	5
Destitutes	10
Clerks	3
Commercial Sex Workers	2

**Table 2: Occupation**

Total number of cases – 100.

Ocular findings present in – 67.

Without Ocular Findings – 33.

Type of ocular Manifestations	Number of findings present in 67 Cases	Percentage of diseases present in ocular positive cases
Anterior segment		
Corneal Ulcer	8	11.9%
Herpes Zoster Ophthalmicus	13	19.4%
Dry eye	16	23.8%
Keratitis	10	14.9%
Anterior Uveitis	28	41.7%
Cataract	12	17.9%

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Blepharitis	2	2.9%
Conjunctival tumour	1	1.4%
Nerve palsy	1	1.4%
Lid abscess	1	1.4%
<b>Total</b>	<b>92</b>	<b>137.3%</b>

**Table 3: Ocular manifestations of HIV & aids disease**

Low vision	6/18-6/60	60
Economic blindness	6/60-3/60	07
Social blindness	3/60-1/60	10
Manifest blindness	1/60-PL	22
Absolute blindness	No pl-No pl	10
Normal vision	6/6-6/6	25

**Table 4: Incidence of blindness related to HIV & AIDS**

**DISCUSSION:** The clinical study has been undertaken for a period of two and half year to document various types of ocular diseases in HIV/AIDS Patient in this region. Total 100 HIV patients' studies, out of this 67 of them who had ocular lesions were examined and investigated.

Out of 100 HIV patients 78% were males and 22% were females. Males to females ratio was 78:22=3.5:1. Majority of these cases belong to 20 to 40 years of age group; sexually most active age group. This is an alarming feature of HIV epidemic in India. The highest incidence of HIV infection was seen in married patients 55% compared to unmarried 41%.

71% of HIV positive male patients had multiple sexual contacts with CSWS. Most of the housewives got the HIV infection through their husband, who had multiple sexual contacts. In one female patient the HIV transmission was due to blood transfusion during the major surgery. In one male patient, the HIV transmission was due to blood transfusion following an accident.

The most common mode of transmission was hetero sexual transmission in 97%. The highest incidence of HIV infection was seen in manual labourers (43%) may be due to illiterate, multiple sexual contacts and unprotected sex, followed by housewives (15%) and drivers (14%). Other groups of HIV positive cases include students (4%), businessmen (5%) and destitute (10%) etc.

Various diseases affecting the eye occur throughout the course of HIV infection. Kaposi sarcoma a common manifestation in the western studies was not seen in any of the patients. Hairy leukoplakia reported very commonly in HIV by various studies. In our study no single case of Hairy leukoplakia was observed. Similarly, orbital lymphomas, endophthalmitis were also not found in our study.

Majority of ocular manifestations with HIV are of infective origin in our study. Viral infections are commonest (30%) ocular manifestations of HIV disease in the present study. Commonest presentation was with cotton wool pots.

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CMV retinitis, herpes zoster was the commonest viral infection seen in this study. Some of these patients were treated with acyclovir 800mg 5 times daily for 7 days. The other common viral infection in our study was herpes simplex. The characteristics clinical features of herpes simplex in our study was ulcerated forms seen over the lips, supra pubic areas and genitalia. Extensive ulceration with prolonged course not responding to routine antibiotics was suspected clinically as herpes simplex with HIV background. These cases were given specific acyclovir treatment 200mg orally 5 times a daily for 7 days, and the lesions regressed.

Adverse cutaneous drug reactions occur more often in HIV infected persons than the general population.

Ocular manifestations may be important primary presenting manifestation or may be associated finding. In more than 56% of the cases in our study patients presented with one colour of ocular manifestations. Therefore eye is the most common organ affected due to AIDS. Ocular involvement in AIDS is as high as 75%. Ocular lesions are varied and affect almost all structures of the eye. This study highlights the importance of clinical presentation of various ocular diseases in HIV disease.

**CONCLUSIONS:** The present study shows that AIDS related ophthalmic manifestations are significant ophthalmic problem and the anterior segment involvement is common with herpes zoster virus and the posterior segment involvement is commonly associated with CMV retinitis correlating with CD4 and CD8 counts.

It may be emphasized that burning awareness to the general public and the treating physician about the various ophthalmic manifestation of AIDS we may tackle the dreaded complication at any stage and therefore prevent the occurrence of blindness to some extent with the present modalities of the treatment. There is an urgent need for better diagnostic and therapeutic approaches to tackle this sight threatening disease.

The constraints expressed by the author help in improving the diagnostic and health care promotion by better availability of ART drugs along with anti CMV drugs like Foscarnet and ganciclovir at an affordable price or free supply by the Govt and training of ophthalmologists to give intravitreal injections at medical college hospitals there by alleviate the ocular complications.

The information on ocular complications of the AIDS may be propagated by handouts both to the doctors and the patients by the GOVT and the NGOs

"I Hope that one day, when death finally comes, by chance or by any infection caused by the virus, nobody says that I was defeated by AIDS. I have succeeded in living with AIDS, AIDS has not defeated me".

### SUMMARY:

1. Period of STUDY: October 2012 to September 2014.
2. Total 100 HIV positive cases were studied 67 of them had ocular lesions.
3. Out of 100, 78 were males and 22 were females.
4. Multiple Sexual contacts were present in 70% of male patients.
5. Hetero sexual transmission was the commonest mode of transmission.
6. Infections are the commonest ocular manifestations in HIV positive patients, 66% of cases.
7. Cotton wool spots (HIV microvasculopathy) were commonest ocular manifestations of HIV disease, followed by cytomegalovirus retinitis, anterior uveitis, herpes virus, corneal ulcer, dry eye and parasite toxoplasma.



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8. Tiny retinal hemorrhages and cotton wool spots are early signs of infections and detected during routine fundus examination. Anterior uveitis Herpes zoster ophthalmicus, problems with eye movements are the characteristics clinical features of this study. Kaposi sarcoma was not seen in this study.

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