

Original Research Article

Study of the Incidence and Various Ocular Manifestations in HIV Positive Cases

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Abstract: Human immunodeficiency virus is responsible for acquired immunodeficiency syndrome. It is a condition in humans in which progressive failure of the immune system allows life-threatening opportunistic infections and malignancies. Ocular lesions in the anterior segment of the eye may include Blepharitis, Dry eye, Herpes Zoster Ophthalmicus, Uveitis, Keratitis, Molluscum contagiosum, Squamous cell carcinoma and Kaposi sarcoma. Ocular lesions in the posterior segment of the eye include Retinal vasculopathy, Unusual malignancies, Neuro ophthalmic lesions and Opportunistic infections like CMV retinitis, Toxoplasma Choroiditis, Syphilitic retinitis etc. of either eye or both eyes. The HIV positive cases examined were from medicine department, surgery department, O and G department, pulmonary medicine, ART centre and patients attending ophthalmology OPD. With widespread introduction of ART in 1987, the ocular manifestations changed their pattern and prevalence. Most of the ocular complains were pain, redness, photophobia, lacrimation, defective vision, foreign body sensation and growth.

Keywords: Immunodeficiency, lentivirus, immune system, pandemic, mortality and morbidity, molluscum contagiosum, Kaposi s sarcoma, CMV retinitis, retinal vasculopathy, herpes zoster ophthalmicus

INTRODUCTION

Human immunodeficiency virus (HIV) is a lentivirus [1] (a member of the retrovirus [2] family) that causes acquired immunodeficiency syndrome (AIDS), a condition in humans in which progressive failure of the immune system [3] allows life-threatening opportunistic infections [4] and malignancies. HIV infection in humans is considered pandemic by the World Health Organization (WHO), affecting about 65 million people worldwide (2008 study). India is the third largest population affected with AIDS accounting to 2-3 million populations. HIV infects about 0.6% of the world's population.

From its discovery in 1981 till 2006, death due to AIDS was more than 25 million. In 2004 itself, AIDS claimed 2.1 million lives which declined to 1.8 million in 2009. Treatment with antiretroviral drugs reduces both the mortality and morbidity of HIV infection. Although antiretroviral medication is still not universally available, expansion of antiretroviral therapy programmes since 2004 has helped to turn the tide of AIDS deaths and new infections in many parts of

the world. Intensified awareness and preventive measures, as well as the natural course of the disease, have also played a role in declining the morbidity.

Ocular lesions associated with HIV, was first reported in USA by Holland et al in the year 1982 and in India it was reported in 1995 by Jyotirmayi Biswas *et al*. Life time risk of developing abnormal ocular lesions in HIV patients varies from 52-100%. Ocular lesions in the anterior segment of the eye may include Blepharitis, Dry eye, Herpes zoster Ophthalmic us, Uveitis, Keratitis, Mollusca contagious, Squamous cell carcinoma and Kaposi sarcoma [5].

Ocular lesions in the posterior segment of the eye include Retinal maculopathy, Unusual malignancies, Neuro ophthalmic lesions and Opportunistic infections like CMV retinitis, Toxoplasma Choroiditis, Syphilitic retinitis etc. [6]. With widespread introduction of ART in 1987, the ocular manifestations changed their pattern and prevalence [7]. Although treatment of AIDS can slow the progression of the disease, there is currently no

vaccine or cure. Antiretroviral therapy reduces the morbidity and mortality. Our work aims to a comprehensive study of the incidence and various ocular manifestations in HIV positive patients.

METHOD

The study was conducted for a period of two years from November 2012 to October 2014 in M.K.C.G. Medical College and Hospital. All patients under study were known HIV positive cases. The present study comprises of all the HIV positive cases that had ocular manifestations. Out of which some were:

- Proved HIV cases attending Ophthalmology dept. with ocular problems.
- HIV positive cases referred from other departments like, Medicine, Surgery, Pediatrics, Pulmonary medicine, Obstetrics and Gynecology.
- HIV positive cases attending the ART centre during the study period.
- **Presenting complain:** Pain, redness, photophobia, lacrimation, defective vision, foreign body sensation, growth of either eye or both eyes.
- **History:** Socioeconomic status, Education, Contact history(h/o unprotected sex with multiple persons, h/o blood transfusion, needle prick or contact with secretions of HIV positive cases), Systemic diseases like TB, DM, Hypertension, Previous history of STD, herpetic infections .
- History of ART medications and its duration.
- Duration of confirmation of HIV infection.
- **Ocular Examination:**
- Ocular Adnexa:
- ii) Ocular movements:
- Lid:
- Conjunctiva:
- Sclera:
- Cornea:

- Anterior chamber:
- Iris:
- Pupil:
- Lens:
- Slit Lamp examination:
- Retinoscopy
- Ophthalmoscopy: Direct and Indirect
- Fundus fluorescence angiography:
- Visual acuity: distant vision, near vision
- Color vision:
- Tonometry:
- Visual field:

Investigations

- Blood: Hb, DC, TLC, ESR, VDRL, FBS, Toxoplasma test (IgM, IgG)
- Urine: routine and microscopic examination
- Sputum for AFB, culture and sensitivity
- Monteux test
- FTA-ABS
- X-ray chest/spine
- ELISA Test
- Western blot and Immunofluorescence test
- CD 4 T Cell count

Detailed ocular examination were done by Slit lamp biomicroscopy, Retinoscopy, Direct and Indirect ophthalmoscopy, Tonometry, Fluorescein staining, fundus photography and Perimetry. The medical records of the patients were used to obtain information on systemic diseases, HIV status, CD4 counts and use of antiretroviral therapy. All the cases were examined with proper precaution of using mask and gloves.

The name and registration number of the patient were kept with us, as record but was not revealed here, to keep the identity of the patient as a secret.

RESULT

Table-1: Incidence of ocular manifestations in hiv positive patients

| Period of study | Total No. of cases | No. of cases with ocular manifestations | Percentage |
|-----------------|--------------------|---|------------|
| Nov'12 - Oct'14 | 219 | 61 | 27.85% |

Though the numbers of patients on ART were more, but not all the patients turned to the Ophthalmology department for examination. Hence, 219 patients who attended the OPD were considered for

the study. Out of which 61 cases were found to have ocular manifestations. As per the present study, the incidence of ocular manifestations in HIV patients was **27.85%**

Table -2: Age distribution

| Age in years | Total no. of cases with ocular manifestations | Percentage (n=61) |
|--------------|---|-------------------|
| 0-10 | 1 | 1.64% |
| 11-20 | 2 | 3.28% |
| 21-30 | 14 | 22.95% |
| 31-40 | 29 | 47.54% |
| 41-50 | 12 | 19.67% |
| 51-60 | 2 | 3.28% |
| >60 | 1 | 1.64% |
| Total | 61 | 100% |

As per the present study, the incidence of ocular manifestations in HIV patients was found to be highest (47.54%) in the age group of 31-40 years.

Mean age of presentation was 34.67 years. Second most common age group affected was between 21-30 years (22.95%).

Table-3: Sex distribution

| Sex | No. of cases | Percentage(n=61) |
|--------------|--------------|------------------|
| Male | 44 | 72.13% |
| Female | 17 | 27.87% |
| Total | 61 | 100% |

Out of the 61 patients, 44 (72.13%) cases were male and 17 (27.87%) cases were female. In the study the male to female ratio was found to be 2.59:1

Table-4: Laterality

| Disease | Unilateral | | | Percentage | Bilateral | | Percentage |
|-----------------------|------------|----------|--------------|------------|-----------|--------------|------------|
| | Right eye | Left eye | Total (n=61) | | Both eyes | Total (n=61) | |
| HZO | 4 | 2 | 6 | 36.07% | - | | 63.93% |
| Molluscum contagiosum | 1 | | 1 | | - | | |
| Conjunctivitis | - | - | - | | 5 | 5 | |
| Blepharitis | - | - | - | | 2 | 2 | |
| Dry eye | - | - | - | | 5 | 5 | |
| Viral Keratitis | 1 | 1 | 2 | | 1 | 1 | |
| Ant. Uveitis | 1 | 1 | 2 | | 1 | 1 | |
| Kaposi Sarcoma | - | 1 | 1 | | - | - | |
| HIV retinopathy | 3 | 5 | 8 | | 17 | 17 | |
| CMV retinitis | - | - | - | | 5 | 5 | |
| Choroiditis | - | 2 | 2 | | 1 | 1 | |
| Papilledema | - | - | - | | 1 | 1 | |
| Optic atrophy | | | | | 1 | 1 | |
| Optic atrophy | | | | | 1 | 1 | |

As per the present study, out of 61 cases, right eyes were involved in 10 (16.39%) cases and left eyes were involved in 12 (19.67%) amounting to a total of 22 (36.07%) cases of unilateral affection, whereas bilateral involvement was seen in 39 (63.93%) cases.

HZO always has a unilateral involvement whereas Conjunctivitis, Blepharitis, Dry Eye and retinopathies are mostly bilateral in presentation. Systemic association of Diabetes and Hypertension could also be a factor for bilateral presentation of retinopathies.

Table-5: Socioeconomic status

| Socioeconomic status | No. of cases | Percentage (n=61) |
|----------------------|--------------|-------------------|
| Low | 40 | 65.57% |
| Middle | 9 | 14.75% |
| High | 12 | 19.68% |
| Total | 61 | 100% |

According to the present study, **40 (65.57%)** cases belonged to low socioeconomic status (SES). Patients in high socioeconomic status (SES) group were next commonly affected population (19.68%) cases

The incidence of HIV is more among patients of either low or high socio economic status. It is comparatively less in middle socio economic status group. It could be due to lower education and awareness

in patients belonging to lower socio economic status. They also stay away from home in some high risk areas for their occupation and earning.

The sophisticated lifestyle in higher socioeconomic status group may lead to increased incidence among this group. Some of the patients in this group also had Diabetes or Hypertension, which could be a contributory factor to the ocular manifestations.

Table-6: Level of education

| Level of education | No. of cases | Percentage (n=61) |
|---------------------|--------------|-------------------|
| Less than class 7 | 35 | 57.38% |
| More than class 7 | 18 | 29.52% |
| Graduates and above | 8 | 13.11% |
| Total | 61 | 100% |

57.38% in the study had an education status below 7th standard. Most of the patients were from the rural areas of Southern Odisha were less educated. They belong to low socioeconomic status, so were more in favor of working to earn for their living rather than to seek education for themselves or for their children.

Wezi M Msisha *et al* (2003-04) in Tanzania observed that there was no marked association between increasing education and HIV sero prevalence. The study is in agreement with the study done by Dr. Ngona Banga Listo (2008).

Table-7: Mode of transmission of disease

| Mode of transmission | No. of cases | Percentage (n=61) |
|----------------------|--------------|-------------------|
| Sexual | 46 | 75.41% |
| Blood transfusion | 8 | 13.11% |
| Drug abuse | 2 | 3.28% |
| Needle prick injury | 3 | 4.92% |
| Mother to child | 2 | 3.28% |
| Total | 61 | 100% |

It is evident from the above table that the major route of HIV transmission (75.41%) is through sexual exposure, due to unprotected sex, uncommon methods of sex (oral sex). Parenteral route involving

blood transfusion, needle prick injuries, accounts to the next most common method of transmission (21.31%) of HIV. Another 3.28% is due to transmission from mother to child.

Table-8: Presenting complains in hiv positive patients under study

| Presenting symptoms | No. of cases (n=61) |
|---|---------------------|
| Redness | 7 |
| Pain | 9 |
| Photophobia | 3 |
| Growth in either or both eyes | 2 |
| Defective vision | 18 |
| Foreign body sensation | 5 |
| Vesicles over the skin in peri-orbital lesion | 6 |
| Asymptomatic | 22 |

In my study, HIV positive patients were mostly referred from ART centre and other departments of M.K.C.G Medical College and Hospital who had no

ocular problems. Next common group had defective vision, either for near or distance which is mostly due to refractive errors, retinopathies or lenticular opacities.

Table-9: Incidence of ocular adnexal manifestations in hiv positive patients

| Adnexal manifestations | No. of cases | Percentage (n=61) |
|----------------------------|--------------|-------------------|
| Herpes zoster Ophthalmicus | 6 | 9.83% |
| Blepharitis | 2 | 3.28% |
| Molluscum contagiosum | 1 | 1.64% |
| Total | 9 | 14.75% |

In the study, out of 61 HIV positive cases, 9 (14.75%) cases had adnexal manifestations and 6 cases presented with Herpes zoster Ophthalmicus, 2 with blepharitis and a single case of Molluscum contagiosum. The HIV patients are immunocomprised, so are vulnerable to various other infections including herpetic infections. Patients with HZO had a prior history of Varicella affection and recurrent zoster infection Blepharitis got cleared with maintenance of

proper lid and scalp hygiene, warm compresses, removal of lid debris with baby shampoo and antibiotic drops and ointments.

The lower incidence of Molluscum contagiosum could be due to less concern of the patients to take any medical help for such growths until they are symptomatic.

Table-10: Visual acuity at presentation in hiv positive patients under study

| VA | Right eye(n=61) | Left eye(n=61) |
|-----------------------|-----------------|----------------|
| 6/6-6/12 | 47 | 46 |
| 6/18-6/36 | 9 | 11 |
| ≥ 6/60 | 4 | 3 |
| Could not be recorded | 1 | 1 |
| Total | 61 | 61 |

Some of the patient's visual acuity improved following treatment with topical drops and ointments (HZO, Keratitis), some improved following ART and T/t of systemic diseases.

Patients having diffuse exudates, intra retinal hemorrhages, associated systemic diseases (diabetic or hypertensive retinopathies), central choroiditis and optic atrophy presented with severe loss of vision.

Table-11: Incidence of anterior segment manifestations in hiv positive patients

| Anterior segment manifestations | No. of cases | Percentage (n=61) |
|---------------------------------|--------------|-------------------|
| Bacterial Conjunctivitis | 5 | 8.20% |
| Dry eye | 5 | 8.20% |
| Viral Keratitis | 3 | 4.92% |
| Anterior Uveitis | 3 | 4.92% |
| Kaposi Sarcoma | 1 | 1.64% |
| Total | 17 | 27.88% |

From the above table, it is observed that, from the 17 (27.88%) cases with anterior segment finding out of 61 HIV positive patients, 5 (8.20%) cases were found to have dry eyes and the same number 5(8.20%) to have bacterial conjunctivitis. Rest included Keratitis 3

(4.92%), Uveitis 3 (4.92%) and Kaposi Sarcoma (1.64%) cases. None were found to be having any Conjunctival microvasculopathy or Conjunctival Squamous cell carcinoma. My study was comparable to the studies reported by other authors.

Table-12: Incidence of posterior segment finding in hiv positive patients

| Posterior segment manifestations | No. of cases | Percentage (n=61) |
|----------------------------------|--------------|-------------------|
| HIV Retinopathy | 25 | 40.98% |
| CMV Retinitis | 5 | 8.20% |
| Choroiditis | 3 | 4.91% |
| Total | 33 | 54.09% |

As per my study, from among the 61 HIV positive patients, 33 (54.09%) cases have posterior segment findings and among them, the most common finding was HIV retinopathy in 25 (40.98%) cases. HIV retinopathy included, Cotton wool spots (CWS), intra

retinal hemorrhages and retinal vascular micro aneurysms. Cotton wool spots were the most common finding in 22 (36.07%) cases. CMV Retinitis was found in 5 (8.20%) cases and rest 3 (4.91%) cases were having Choroiditis.

Table-13: Cd4 T cell count and ocular manifestations in HIV positive patients

| CD4 T Cell count (cells/mm ³) | Ocular manifestations | No. of cases (n=61) | Percentage |
|---|----------------------------|---------------------|------------|
| >500 | Conjunctivitis | 5 | 8.20% |
| | Herpes zoster Ophthalmicus | 4 | 6.56% |
| | Keratitis | | |
| | Uveitis | 3 | 4.92% |
| | Dry Eye | 3 | 4.92% |
| | Blepharitis | 2 | 3.28% |
| | MC | 2 | 3.28% |
| 200-499 | Dry Eye | 3 | 4.92% |
| | Herpes zoster Ophthalmicus | 2 | 3.28% |
| 51-199 | HIV Retinopathy | 25 | 40.98% |
| | Choroiditis | 3 | 4.92% |
| | Papilledema | 1 | 1.64% |
| | Kaposi sarcoma | 1 | 1.64% |
| <50 | CMV Retinitis | 5 | 8.20% |
| | Optic atrophy | 1 | 1.64% |

In the study, CD 4 cell count was evaluated. Patients with CD 4 T cell count < 50 cells/mm³ manifested with CMV retinitis. None of the patient with higher CD 4 T cell count had CMV retinitis. The

patients having a CD 4 Tcell count of >500 cells/mm³ presented with Conjunctivitis, HZO, Keratitis, Uveitis, Dry eye, Uveitis, Blepharitis and Molluscum Contagiosum .

Table-14: Art treatment and hiv positive patients

| ART | No. of cases (n=61) | Percentage |
|--------------|---------------------|------------|
| Yes | 45 | 73.77% |
| No | 16 | 26.23% |
| Total | 61 | 100% |

Out of the 61 HIV positive patients, 45(73.77%) cases were on ART and rest 16 (26.23%) patients were not receiving any ART. The patients on ART were mostly referred from ART centre. The newly diagnosed HIV positive were those referred from other departments of our hospital for certain ocular ailments or simply for screening of any ocular manifestations. they were advised to attend the ART center for medical therapy.

SUMMARY AND CONCLUION

As per the study, the incidence of ocular manifestations was found to be 27.85% which was at par with other studies of various parts of the world. The most common ocular manifestations were in the posterior segment of the eye 54.09%, followed by 27.88% in anterior segment. HIV retinopathy was the most common mode of presentation (40.98%). Cotton wool spots were found in 36.07% cases. This was followed by Herpes zoster Ophthalmicus 9.83% followed by conjunctivitis, Dry eye and CMV retinitis, each 8.20%, anterior uveitis, Viral Keratitis, and Choroiditis each of 4.92%; 3.28% cases of Blepharitis and 1.64% each of Molluscum contagiosum, Kaposi sarcoma, Papilledema and Optic atrophy [9]. Hence, all the HIV positive patients should be screened for any ocular involvement as they may be asymptomatic but may have a posterior segment pathology which if not diagnosed at an early stage could lead to some blinding disease.

The posterior segment findings were detected in 33 (54.09%) patients with a CD 4 T cell count below 200 cell/mm³. CMV retinitis was in 5 (8.20%) patients who had a CD 4 T cell count <50 cell/mm³. CD 4 T cell count is an important deciding factor in HIV and AIDS patient for the initiation of ART. Hence, periodically CD 4 T cell should be monitored to record any decline in the CD 4 T cell count and immediate measures can be taken [10]. HIV is a deadly disease taking tolls of life if untreated. Most of the HIV/AIDS patients present with ocular manifestations at some point of their disease process when the CD 4 T cell count gradually declines below a critical level.

In the present study, most common ocular findings were HIV retinopathy of which Cotton wool

spots were the most frequent finding. Early diagnosis and starting of antiretroviral treatment can maintain CD4 T cell concentration, decrease the viral load and prevent various ocular complications and thus resulting morbidity contributed by HIV infection.

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