

Original article ●●●●

## Ocular manifestations in HIV/AIDS cases in Nepal

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### Abstract

**Background:** A significant number of patients with HIV/AIDS can have ocular manifestations. Almost every structure in the eyes can be affected in this condition.

**Objective:** To study various ocular manifestations in the cases known to be infected with HIV.

**Materials and methods:** A cross-sectional descriptive study was carried out including 117 subjects positive for HIV using the purposive sampling method. Their demographic pattern and ocular findings were studied. Findings were recorded in the pro forma developed for the study.

**Statistics:** SPSS ver 14.0 was used for data analysis. The p value of <0.05 was considered as significant.

**Results:** A total of 117 HIV infected cases were included in this study. Among them, 76 (64.95 %) were male and 41 (35.05 %) female. The mean age of the subjects was 30.04 ± 11.32 years. The duration of HIV detection ranged from 1-5 years. Ocular complaints were present in 26.49 % of the subjects. Ocular manifestations were present in 56 % of the patients with complaints and in 27.3 % of asymptomatic patients. Ocular involvement was seen in 55 (47 %) patients. The common anterior segment findings were herpes zoster ophthalmicus (4.27 %), anterior uveitis (2.56 %), blepharitis (2.56 %) and conjunctivitis (1.7 %), whereas HIV retinopathy (19.6 %), CMV retinitis (5.1 %), ocular toxoplasmosis (2.5 %) and presumed ocular tuberculosis (0.85 %) were common posterior segment findings.

**Conclusion:** Herpes zoster ophthalmicus, anterior uveitis, HIV retinopathy and CMV retinitis are common ocular manifestations associated with HIV infections.

**Keywords:** HIV/AIDS, anterior and posterior segments, ocular involvement

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### Introduction

HIV has the capability to affect every organ and system of the body by direct damage by the virus or by making the host susceptible to opportunistic infections. Ocular manifestations have been reported in 70-80 % of individuals infected with HIV and it has become

apparent that the ocular manifestations always reflect systemic disease and may be the first sign of disseminated infections in many cases. Ophthalmologists may be the first ones to detect a sight-saving and life-prolonging diagnosis (Jabs DA et al, 1996).

The first description of ocular manifestations in HIV/AIDS was noted in 1983 and since then several studies have reported ocular manifestations in HIV/AIDS. Before the introduction of HAART numerous reports described the ocular complications of AIDS (Janet T et al, 2003).

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The ocular lesions can be classified by the ocular structure involved (Cunningham ET & Margholis TP, 1998).

### **Adnexal manifestations**

Herpes zoster ophthalmicus, Kaposi's sarcoma, Molluscum contagiosum.

### **Anterior segment manifestations**

Keratoconjunctivitis sicca, infectious keratitis, iridocyclitis.

### **Posterior segment manifestations**

Retinal microvasculopathy, infectious retinitis, CMV retinitis, infectious choroiditis, intraocular lymphoma

### **Neuro-ophthalmic lesions**

Papilloedema, optic neuritis, optic atrophy, cranial nerve palsy.

### **Orbital lesions**

orbital lymphoma, orbital cellulitis, orbital Kaposi's sarcoma

There is a scarcity of published data on the prevalence of ocular manifestations of HIV/AIDS from Nepal. This study was carried out to find out the same.

### **Materials and methods**

A descriptive cross-sectional study was carried out at the B.P Koirala Lion's Center for Ophthalmic Studies (BPKLCOS) and various rehabilitation centers in Kathmandu during January 2007 to June 2008. The subjects in the rehabilitation centre were the patients referred from various parts of Nepal. An informed consent was obtained from the subjects before including them in the study. The purposive sampling method was used. Their demographic pattern and ocular findings were studied. Findings were recorded in the pro forma developed for the study.

### **Statistics:**

SPSS ver14.0 was used for data analysis. The p value of <0.05 was considered as significant.

### **Results**

A total of 117 cases were included in this cross-sectional study. The majority of the patients (41 %) were in the age group 31 - 40 years followed by 21-30 years (37.6 %). The mean age of males was 29.78 ±11.30 years with and of females was 30.54 ±11.47 years. The mean age of the total cases was 30.04 ±

11.35 years. Male and female were 76 (64.9 %) and 41 (35.1 %) respectively, which comprised the ratio of 1.8:1. The difference between age and gender was not statistically significant (p= 0.5).

The majority (93.1%) of the patients had visual acuity between 6/6-6/18 (Table 1).

A total of 55 (47 %) cases had various ocular involvements. About 60.5 % patients in the age range of 31-40 years showed ocular involvement, whereas 100 % of the patients in the age group of 51-60 years had ocular involvement. Almost 100 % of the patients in the age range of 0-20 years had no ocular involvement. The commonest anterior segment manifestations were very nonspecific-like conjunctivitis, stye, blepharitis and Herpes zoster ophthalmicus, whereas posterior segment manifestations were HIV retinopathy, CMV retinitis, ocular toxoplasmosis and presumed ocular tuberculosis. 35.8 % of the patients had a CD4+ count of more than 500 cells/mm<sup>3</sup> followed by 37 (31.7 %) patients with a CD4+ count of between 51-199 and 15 (12.9 %) patients with the count between 200-500 cells/mm<sup>3</sup>. The mean CD4+ cell count was 324 ± 279 cells/mm<sup>3</sup>. The highest count was 1500 and the least was 3 cells/mm<sup>3</sup>. Ocular involvement in patients with the CD4+ count of <50 was the highest, accounting for 100%, followed by patients in the group with the CD4+ count of 51-199 cells/mm<sup>3</sup> (63.8 %), while ocular involvement was the least among those with the CD4+ count above 500 cells/mm<sup>3</sup>, accounting for only 12 %. The association between CD4+ count and ocular involvement was statistically significant (p=0.0002). Only 34 (29 %) of the total 117 HIV patients were aware of ocular involvement in HIV/AIDS. 46.1 % of the total HIV infected cases also had other associated systemic illnesses too and pulmonary tuberculosis was the commonest (62.9 %) among these systemic illnesses. The commonest presenting symptom was decreased vision (47.5 %) followed by floaters (17.5 %), foreign body sensation and ocular discomfort.

### **Discussion**

In this study, 64.95 % (n=76) of the patients were male and 35.05 % (n=41) were female, with the male:female ratio of 1.85:1. Similar studies carried out at various other centers also showed male preponderance (Table 4).

**Table 1**  
**Visual acuity at presentation**

| Visual acuity | OD  | Percent (%) | OS  | Percent |
|---------------|-----|-------------|-----|---------|
| 6/6-6/18      | 107 | 91.45       | 109 | 93.16   |
| <6/18-6/60    | 4   | 3.41        | 4   | 3.41    |
| <6/60-3/60    | 2   | 1.7         | 2   | 1.7     |
| <3/60-CFCF    | 2   | 1.7         | 1   | 0.85    |
| PL            | 2   | 1.7         | 0   | 0       |
| NPL           | 0   | 0           | 1   | 0.85    |
| Total         | 117 | 100         | 117 | 100     |

**Table 2**  
**Patient distribution according to ocular complaints and ocular involvement**

| Ocular complaints     | Diagnosis           |                    | Total |
|-----------------------|---------------------|--------------------|-------|
|                       | Normal findings (%) | Ocular disease (%) |       |
| Present (symptomatic) | 3 (9.6)             | 28 (90.4)          | 31    |
| Absent (asymptomatic) | 59 (68.6)           | 27 (31.4)          | 86    |
| Total                 | 62 (53)             | 55 (47)            | 117   |
| P value               | <0.001              |                    |       |

Table 2 shows that 28 (90.4 %) of the symptomatic patients had ocular involvement, whereas 27 (31.4 %) of the asymptomatic patients also had ocular involvement (p=<0.001).

**Table 4**  
**Comparison of studies done in different centers with our study**

| Study              | Jabs et al, USA (1995) | Ebana MC et al Cameroon (2005) | Assefa et al, Ethiopia (2004) | Present Study |
|--------------------|------------------------|--------------------------------|-------------------------------|---------------|
| Sample size        | 781                    | 57                             | 125                           | 117           |
| Male               | 88 %                   | 52.9 %                         | 55.2 %                        | 64.9 %        |
| Female             | 12 %                   | 47.4 %                         | 44.8 %                        | 35.1 %        |
| Ocular involvement | 50 %                   | 63.2 %                         | 70 %                          | 47 %          |

**Table 3**  
**Patient distribution according to ocular disease and CD4+ count**

| Ocular disease                                   | CD4+ T Lymphocyte count (cells/mm <sup>3</sup> ) |           |         |      | Total |
|--|--|-----------|---------|------|-------|
|  | > 500  | 200 - 499 | 51- 199 | < 50 |       |
| Normal findings                                  | 37   | 12        | 13      | 0    | 62    |
| Conjunctivitis                                   | 1  | 0         | 1       | 0    | 2     |
| Blepharitis                                      | 1  | 0         | 1       | 1    | 3     |
| Stye   | 2  | 1         | 2       | 0    | 5     |
| Herpes zoster ophthalmicus                       | 0  | 2         | 2       | 1    | 5     |
| Papilloedema                                     | 0  | 0         | 1       | 1    | 2     |
| CMV retinitis                                    | 0  | 0         | 1       | 5    | 6     |
| Cryptococcal choroiditis                         | 0  | 0         | 1       | 1    | 2     |
| Toxoplasmosis                                    | 0  | 0         | 2       | 1    | 3     |
| HIV retinopathy                                  | 0  | 0         | 11      | 12   | 23    |
| Ocular tuberculosis                              | 0  | 0         | 1       | 0    | 1     |
| Retinal detachment                               | 0  | 0         | 1       | 0    | 1     |
| Retro bulbar optic neuritis                      | 1  | 0         | 0       | 0    | 1     |
| Bilateral lateral rectus palsy with papilloedema | 0  | 0         | 0       | 1    | 1     |
| Total  | 42   | 15        | 37      | 23   | 117   |

A demographic study done by Aich T K et al (2004) in Nepal, also found male preponderance in HIV infection, accounting for 86 % .This male preponderance may be because of more involvement of males in high-risk behavior for HIV/AIDS.

The mean age in this study was 30.04 ± 11.32 years. The majority (78.63 %) of them were between the age-range of 20 to 40 years which is similar (76 %) to the study by Biswas et al (2000). In another study done by Kailaru KR et al (2004), the mean age of presentation was 40 years in 58.5 % of all cases.

The ocular involvement in our study was noted in 55 patients (47%), which is close to the study by Biswas

et al (2000), where involvement was present in 40 %. Similarly, Ndoye et al (1993) found ocular involvement in 52.33 % cases.

In our study, 12.8 % of the cases had anterior segment manifestations. The commonest manifestations were stye and Herpes zoster ophthalmicus (HZO) which comprised 4.27% each, followed by blepharitis (2.56 %) and conjunctivitis (1.7 %). This is quite similar to the studies by Assefa et al (2004), Sriprakash et al (2004) and Osahon et al (2002) where HZO was the commonest anterior segment manifestation comprising 5.6 %, 10 % and 2.7 % respectively. There was not a single case of Kaposi's sarcoma in our study, as was the case in similar Indian studies. This may be attributed to the fact that homosexual behavior is less commonly practised in this subcontinent than in the western countries (Table 5).

Similarly, posterior segment manifestations in our study were present in 33.33 % of the total cases with the commonest being HIV retinopathy (19.65 %) in the form of cotton-wool-spot, microaneurysms and hard exudates followed by cytomegalovirus retinitis (5.1 %) which are almost similar to the study by Assefa et al (2004) in Ethiopia. The incidence of CMV retinitis was much higher in other studies by Muccoili et al (2000) in Brazil and Pepose et al (2002) in USA, where the CMV retinitis was present in 25 % and 40 % respectively. This may be due to the fact that those studies were done before the initiation of highly active anti-retroviral therapy (HAART). In our study 47.86 % of the patients were receiving HAART. Out of the total of 56 (47.8 %) patients under highly active anti-retroviral therapy (HAART) in our study, the majority had been on HAART for less than 6 months, whereas only 2 patients were receiving HAART for the last five years.

In our study, 3.41 % of the total cases had neuro-ophthalmic lesions, whereas in the study by Assefa et al (2004) neuro-ophthalmic lesions comprised 9.6 %. The commonest neuro-ophthalmic lesion was papilloedema (1.7 %) which was due to intra-cranial space occupying lesion (ICSOL), followed by optic neuritis and cranial nerve palsy that comprised 1 case each (0.85 %). These manifestations are similar to the studies done in Brazil and India (Table 7).

Regarding the pediatric age group, a total of 11 (9.4 %) patients were enrolled in the study. Ocular involvement

was not seen in any one of them. In a study by George AE et al (2000) ocular manifestations were noted in 50 % of the children with HIV/AIDS, whereas similar studies by Dennehy et al (1989) and Icoona et al (2003) found ocular involvement in 20 % and 35 % respectively. The low number of paediatric patients in our study may be because their parents were themselves unaware of their HIV status. The lack of ocular manifestations in these children may be due to the higher range of CD4+ count in the paediatric patients enrolled in this study.

**Table 5**  
**Anterior segment manifestation in different studies**

| Anterior segment manifestations | Assefa et al, Ethiopia (2004) | Sriprakash K.S et al, India (2004) | Osahon et al USA 2002 | Present study in Nepal |
|---------------------------------|-------------------------------|------------------------------------|-----------------------|------------------------|
| Herpes zoster ophthalmicus      | 5%                            | 10.65%                             | 2.7%                  | 4.27%                  |
| Blepharitis                     | 0                             | 1.4%                               | 0                     | 2.56%                  |
| Stye                            | 0                             | 0                                  | 0                     | 4.27%                  |
| Conjunctivitis                  | 0                             | 0                                  | 0                     | 1.7%                   |
| Molluscum contagiosum           | 4.8%                          | 0.57%                              | 0                     | 0                      |
| Anterior uveitis                | 7.4%                          | 5.71%                              | 0.4%                  | 0                      |
| Kaposi's sarcoma                | 0                             | 0                                  | 0                     | 0                      |
| Keratitis                       | 0                             | 1.14%                              | 0                     | 0                      |
| Corneal opacity                 | 0                             | 3.42%                              | 0                     | 0                      |

**Table 6**  
**Posterior Segment manifestations in different studies**

| Study                    | Assefa et al (2004), Ethiopia | Muccoili et al (2000), Brazil | Pepose et al (2002), USA | Present study in Nepal |
|--------------------------|-------------------------------|-------------------------------|--------------------------|------------------------|
| HIV retinopathy          | 24%                           | 0                             | 40%                      | 19.6%                  |
| CMV retinitis            | 1%                            | 25%                           | 34%                      | 5.1%                   |
| Ocular toxoplasmosis     | 0                             | 8.5%                          | 0                        | 2.5%                   |
| Cryptococcal choroiditis | 0                             | 0                             | 6%                       | 1.7%                   |
| Retinal detachment       | 0                             | 0                             | 0                        | 0.85%                  |
| Ocular tuberculosis      | 0                             | 0                             | 0                        | 0.85%                  |





**Table 7**  
**Neuro-ophthalmic lesions in different studies**

| Study                   | Assefa et al (2004) Ethiopia | Muccoili et al (2000), Brazil | Sri Prakash K.S et al (2004), India | Present study in Nepal |
|-------------------------|------------------------------|-------------------------------|-------------------------------------|------------------------|
| Neuro-ophthalmic lesion | 9.6 %                        | -                             | -                                   | 3.4 %                  |
| Papilloedema            | -                            | 2.2 %                         | 2.28 %                              | 1.9 %                  |
| Optic neuritis          | 0                            | 0                             | 0                                   | 0.85 %                 |
| Optic atrophy           | 0                            | 1.6 %                         | 2.8 %                               | 0                      |
| Cranial-nerve palsy     | -                            | -                             | 1.7 %                               | 0.85 %                 |

In our study, the presenting visual acuity was fairly good, being better than 6/60 in each eye in 96.5 %, which is almost similar to the study by Biswas et al (2000). Singh et al (2002) reported the better-than 6/60 of visual acuity in almost 80 % of the subjects. This difference may be due to the comparatively less number of CMV retinitis cases in our study.

### Conclusion

Both anterior as well as posterior segments can be equally involved in HIV/AIDS. Posterior segment complications are more potentially sight-threatening. Similarly, the patients with a lower CD4 count and those not receiving the HAART are more vulnerable to the posterior segment complications.

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