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Original Research Article

Prevalence of ocular manifestations in HIV patients

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ABSTRACT

Aims: To study the prevalence of ocular manifestations in the HIV-positive individuals and find out the different types of ocular manifestations in HIV patients based on their CD4 count levels.
Materials and Methods: This is a cross-sectional observational study with a sample size of 70 which will be conducted in department of Ophthalmology at Trichy SRM Medical College Hospital & Research Centre. This study includes all HIV positive patients irrespective of their age group, gender.
Results: A total of 70 cases were included in this study. HIV induced ocular manifestations were present in 33 out of 70 patients which has accounted for 47% in our study. Most of the patients with HIV were in the age group ranging between 20 years to 70 years. Most commonly seen ocular manifestations were anterior segment manifestations accounting for 33.33% and then adnexal manifestations (27%), posterior segment manifestations (24%) and the neuro-ophthalmic manifestations (15.15%). Ocular manifestations with highest prevalence were seen to be present in population with CD4 ranging between 250-300 cells/mm. Of these anterior segment manifestations were common.
Conclusion: In our study, anterior segment manifestations were more commonly seen than posterior segment manifestations. Dry Eye disorder and HIV Retinopathy are the most commonly seen manifestations. Early screening of HIV positive individual should be done for the ocular manifestations at time of diagnosis.

1. Introduction

HIV had it's origin in Kinshasa, the democratic republic of Congo at around 1920 where the virus had been transmitted from chimpanzees to the humans.[1] HIV virus has two types: HIV-1 and HIV-2. HIV-1 which is found to be more virulent and it occurs worldwide.[2] HIV-2 has less chances of transmission and is mainly confined to West Africa.[3] The first noted case of HIV-1 was from a man in Congo in 1959. The first ocular lesion was reported from Sankara Nethralaya, Chennai in 1995.

HIV-AIDS was discovered in the early 1970s. AIDS is a devastating disease characterized by many systemic as well as ocular manifestations and doctors are facing a major challenge all across the world in treating it. Five cases of AIDS was first reported in United states on June 5,1981.[1,3] The first few cases were cluster of injectable drug users and gay men, those who had showed symptoms with pneumocystis carinii infection.

HIV continues to be major health issue. In 2017, estimated amount of people living with HIV was found to be 36.9 million. Prevalence rate among the children was 0.8%. As of 2021, new infections were estimated to be 1.5 million people showing 32% decline as from 2010.[4] Ocular manifestations are seen in 40 – 70% of HIV patients.[5] It

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can be caused by opportunistic infections, immunological reactions, neoplasms & HIV infection. It can affect almost all the structures of the eye.

CD-4 Count is a reliable predictor of severity of HIV Infection. Its level depends upon the severity of viral infection (i.e.) viral load. Depending upon the viral load and CD4 count systemic, as well as ocular manifestations occur.[6,7]

2. Materials and Methods

This is a cross sectional observational study which was conducted in ophthalmology outpatient department at Trichy SRM medical college hospital and research centre.

The sample size was calculated using the proportionate method with the available prevalence data as 24.32% during the start of study. The study was conducted after getting Institutional Ethics committee (IEC) approval Ref. No: TSRMMCH&RC/ME-1/ 2020 – IEC NO:20.

All HIV positive individuals irrespective of age and gender visiting Ophthalmology OPD or referred from Dermatology, Venerology, Leprosy department from December 2020-Novemeber 2022 were included in the study. Patients having diabetes mellitus, hypertension, ocular trauma, congenital or acquired retinal diseases and recent retinal surgery were excluded from study.

Before the start of the examination, informed and written consent was obtained. Confidentiality of the patient was maintained. Visual acuity for both distant and near vision using Snellen's chart, color vision, field of vision were recorded. Then anterior segment was examined under slit lamp and posterior segment examination was conducted using indirect ophthalmoscope and +90D examination after dilatation with tropicamide (1%) and phenylephrine (0.8). Patient who had ocular findings were subjected to anterior segment and fundus photography.

3. Results

Seventy seropositive patients were examined out of these 33 patients (47%) had ocular manifestations. Age wise distribution showed that most of them were in age group of 20-70 years (Figure 1). Among the persons affected with HIV, males were found to have higher ocular manifestations as compared to females in ratio of 18:15 or 6:5 (Figure 2).

Total no of people with anterior segment manifestations were 11 which accounted for 33.33%. Among the anterior segment manifestation, most of them presented with Dry eye and then 3 patients with subconjunctival haemorrhage and two with anterior uveitis and a patient with conjunctival micro-vasculopathy (Figure 3)

Adnexal manifestation accounted for 27% (9) of total ocular manifestations in HIV population. Among the adnexal manifestations, blepharitis is more common which accounts for 42% of adnexal manifestations followed by stye which was present in 3 patients which accounted for 32% of adnexal manifestations (Figure 4).

Posterior segment manifestations accounted for 24.24% of total ocular manifestations among HIV individuals. HIV Retinopathy is found to be highly prevalent among posterior segment manifestations accounting for 50% and then followed by retinal vasculitis accounting for 37% and intermediates uveitis for 13% (Figure 5). HIV

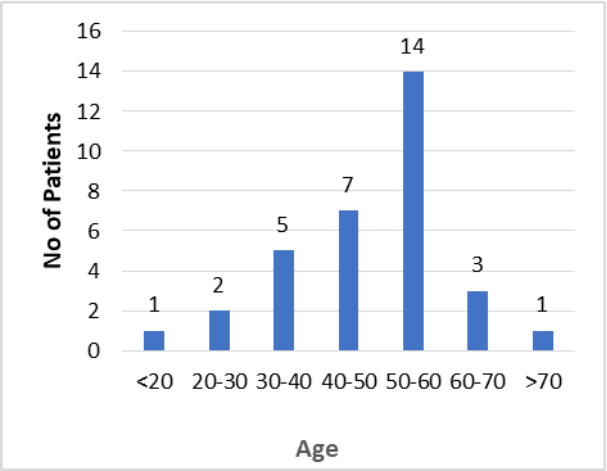

Figure 1: Age wise distribution

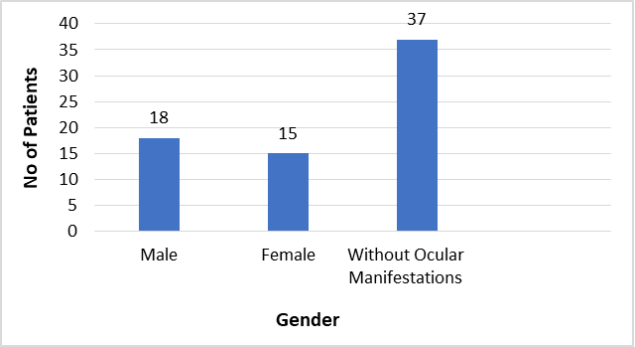

Figure 2: Gender wise distribution

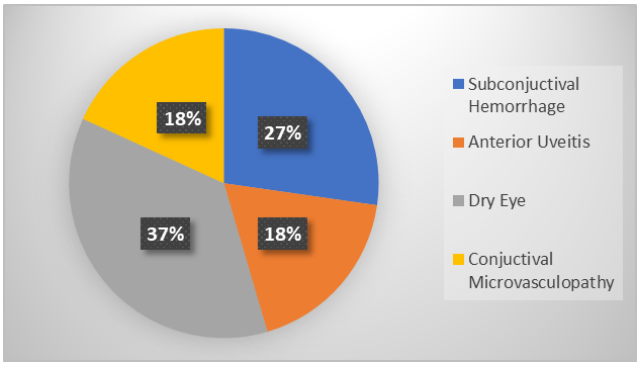

Figure 3: Anterior segment manifestations

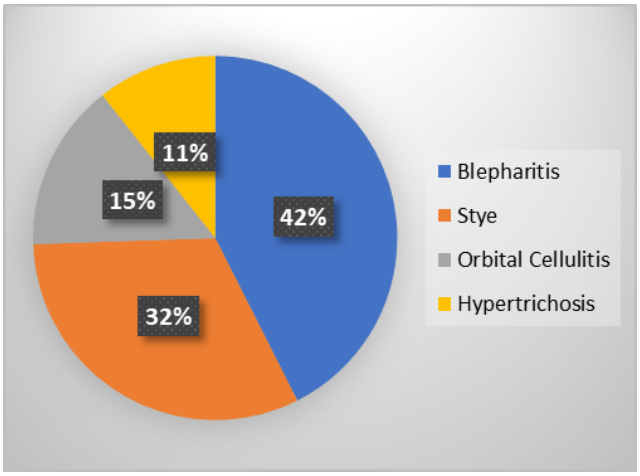

Figure 4: Adnexal manifestations

microangiopathy is equally found in PLHIV with CD4 count ranging between 200-500 and <200 cell/cu.mm (Figure 6). One patient with CD4 count >500 had HIV microangiopathy.

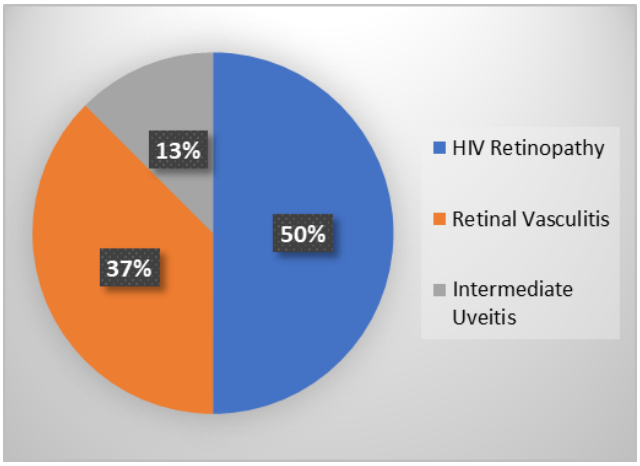

Figure 5: Posterior segment manifestations

Neuro-ophthalmic manifestations accounted for 15.15% of HIV Induced Ocular Manifestation Population. Among the neuro-ophthalmic manifestations cranial nerve palsy and HIV induced optic neuritis accounted for 80% (40+40) and optic atrophy in 20% (Figure 7).

Ocular manifestations were seen to be present in larger numbers in those who had CD4 count ranging between 250-500 cells/cu.mm. Among those who had 250-500 cell range the anterior segment manifestations were common preceded by posterior segment and neuro-ophthalmic manifestations and these individuals didn't exhibit any adnexal manifestation. Greater number of individuals had their CD4 count more than 500 cells which shows the efficacy of treatment after initiation of HAART (Table 1).

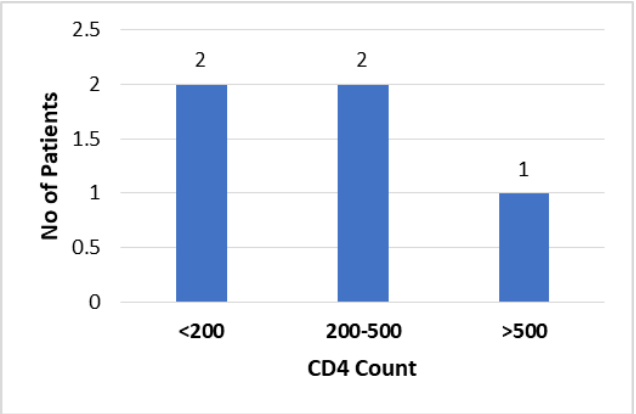

Figure 6: CD4 count and HIV microangiopathy

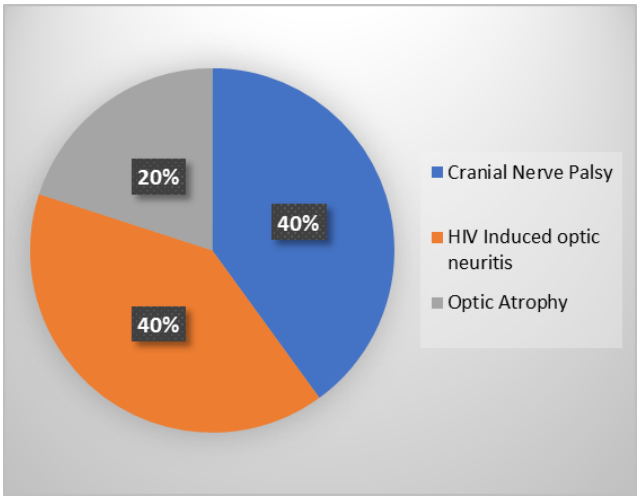

Figure 7: Neuro-ophthalmic manifestations

HIV induced ocular manifestations were seen more in people receiving HAART therapy for a duration of <12 months accounting for 39% (Figure 8). Only 4 (12.12%) HIV positive Individuals were seen to have ocular manifestations who had duration of intake of HAART for more than 60 months.

4. Discussion

In this study, total no of cases observed were 70 which included 70 eyes of HIV positive patients. Total no of patients with HIV induced ocular manifestations were 33 out of 70 patients which had accounted for 47% in our study. J Biswas et al,[8] reported an incidence of 40-70%. Morskole et al.,[9] observed a prevalence rate of 52.2% in their study. (Table 2).

Most of the patients with HIV were in the age group ranging between 20 years to 70 years. The mean age group in this study was 45 years. Most of the patients with ocular manifestations were in the age group ranging between 50-60

Table 1: CD4 count and Ocular manifestations

CD4 Levels	No of Patients with/without Ocular Manifestation	No of Patients with Anterior Segment Manifestation	No of Patients with Posterior Segment Manifestation	No of Patients with Neuroophthalmological Manifestation	No of Patients with Adnexal Manifestation
>500	34	-	1	1	-
250-500	17	5	3	3	-
150-250	9	2	2	1	3
50-150	5	3	-	-	2
<50	5	1	2	-	3

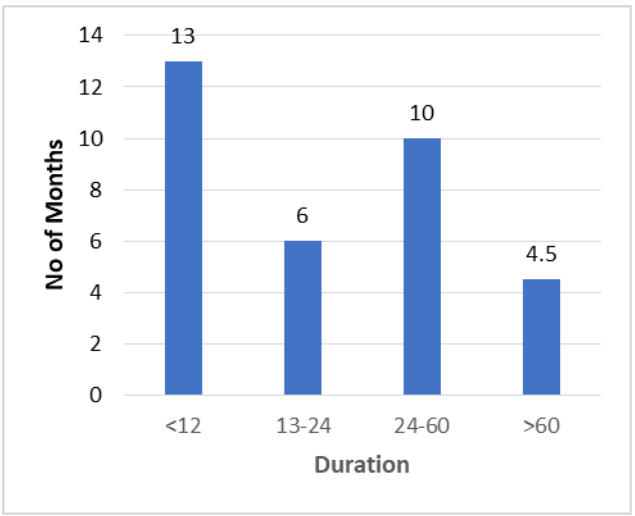

Figure 8: Duration of HAART

years which accounted for 20% of population affected with HIV.

The gender who had greater prevalence of ocular manifestations were found to be males which accounted for 55% of population with ocular manifestations, in comparison with female which accounts for 45% of population with ocular manifestations. The reason for the more prevalence among males is their nature of work and economic freedom. Ahmed et al., in their study said that male accounted for 52% and females accounted for 48% with ocular manifestations which nearly correlates with our study.

The anterior segment manifestations were seen to present in 11 persons which had contributed for 33.33% of population with HIV related ocular manifestations. Among the anterior segment manifestations most common manifestation noted was dry eye followed by subconjunctival haemorrhage, anterior uveitis, conjunctival micro-vasculopathy.

The number of individuals with posterior segment manifestations were 8, which accounts for 24.24% of HIV related ocular manifestations in our study. Most common posterior segment manifestation noted in our study was HIV retinopathy then comes the retinal vasculitis and intermediate uveitis. Biswas et al.,[8] in their study said posterior segment manifestation most commonly seen was HIV retinopathy. G Pai et al.,[10] in his study stated that dry eye was the most anterior segment manifestation and HIV retinopathy was the most common posterior segment manifestation which correlates with our study.

The neuro-ophthalmic manifestations were present in 5 persons which contributed to about 15.15% of total ocular manifestation related population. Most common was cranial nerve palsy followed by HIV induced optic neuritis and optic atrophy. Hothi et al.,[11] showed that 11% had neuro-ophthalmic abnormality in their study.

The adnexal manifestations were seen to present in 9 persons which contributed for 27% of ocular manifestation related population. Among these most commonly seen were blepharitis followed by stye, hypertrichosis and orbital cellulitis.

Of all the manifestations most commonly seen ocular manifestations was the anterior segment accounting for 33.33% and then adnexal (27%), posterior segment (24%) and the neuro-ophthalmic manifestations (15.15%).

In this study, ocular manifestations with the highest prevalence were seen to be present in population with CD4 ranging between 250-500 cells/cu.mm of these anterior segment manifestations were common.

HIV microangiopathy was seen in patients with CD4 count ranging between >500 and between 250-500.

Most of the HIV patients with ocular manifestations were on HAART for a duration of less than 12 months as the duration of HAART therapy increased the prevalence of ocular manifestations. Amasalu et al.,[12] said the ocular manifestations are declining in upcoming years due to initiation of HAART.

From this study, we can say that anterior segment manifestations were more commonly seen than posterior segment manifestations. Patients with ocular manifestations could not be adequately screened due to lack of awareness, lack of knowledge among health care professional regarding the disease and its effects on eye and lack of ophthalmic services for appropriate management.

Table 2: Prevalence of ocular manifestations among various studies

Studies	Our Study	Bekele et al[13]	Sudharshan et al[14]	Hoth et al[11]	Kumari et al[15]	Morskole et al[9]	Biswas et al[8] (1999)	Sahoo et al[16]
Prevalence	47%	25.3%	68.5%	39%	28.5%	52.2%	45.7%	70%

5. Conclusion

HIV/AIDS is one of the greatest challenges to human beings affecting nearly every part in our body. Ocular manifestations involves all the four areas which includes anterior segment, posterior segment, neuro-ophthalmic and adnexal manifestations. Early screening of HIV positive individual should be done at time of diagnosis. Six monthly screening should be done after the start of HAART. Ophthalmic evaluation should be done once in 6 months if CD4 count>100 cells/cu.mm or once in 3 months if CD4 count <50 cells/cu.mm. Screening for retinal disease can be done at home by self-assessment with Amsler's grid. Routine screening of every patient before the initiation of HAART should be done to know the initial ocular status. This can be done by setting up ophthalmic personnel at ART centre or nearby. Hence, the study emphasizes the importance on routine ophthalmic screening in people with HIV positive. Early recognition and early treatment can be done so as to provide good quality of vision.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Jameson JL, Fauci A, Kasper D, Hauser S, Longo D, Loscalzo J. Harrison Principles of Internal Medicine. 19th ed. India: McGraw-Hill Education; 2017.
2. Oladipo EK, Awoyelu E. Pathogenesis of HIV: Pathway to eradication. *Adv Appl Sci Res*. 2015;6(5):81–7.
3. Cornelissen CN, Fisher BD, Harvey R. Lippincott's Illustrated Reviews: Microbiology. 3rd ed. Lippincott Williams & Wilkins; 2012. p. 293–306.
4. Global HIV & AIDS statistics — Fact sheet. Available from: https://www.unaids.org/en/resources/fact-sheet.
5. Cunningham ET. Uveitis in HIV positive patients. *Br J Ophthalmol*. 2000;84(3):233–5.
6. Tsai JC, Denniston AKO, Murray PI, Huang JJ, Aldad TS. Oxford American Handbook of Ophthalmology. New York: Oxford University Press Inc; 2011.
7. Gichuhi S, Arunga S. HIV and the eye. *Community Eye Health*. 2020;33(108):76–8.
8. Biswas J, Kumaraswamy N, Soloman S. Ophthalmic manifestations of Human Immunodeficiency Virus (HIV) in India. *Indian J Ophthalmol*. 1999;47:87–93.
9. Morskole S, Som V, Dubey A, Kumar K, Bamhane P, Tekam DK. A study of ocular manifestations in HIV positive patients. *Indian J Clin Exp Ophthalmol*. 2022;8(1):72–8.
10. Pai SG, Mounika V. Ocular Manifestations of HIV: A Hospital-Based Study. *Online J Health Allied Scs*. 2019;18(1):5.
11. Hothi HS, Gohil NR, Parekh NV, Patel SS. A prevalence study of ocular manifestations in HIV positive patients on highly active anti-retroviral therapy. *Int J Community Med Public Health*. 2019;6(7):2950–4.
12. Amsalu A, Desta K, Nigussie D, Delelegne D. Ocular manifestation and their associated factors among HIV/AIDS patients receiving highly active antiretroviral therapy in Southern Ethiopia. *Int J Ophthalmol*. 2017;10(5):776–81.
13. Bekele S, Gelaw Y, Tessema F. Ocular manifestation of HIV/AIDS and correlation with CD4+ cells count among adult HIV/AIDS patients in Jimma town, Ethiopia: a cross sectional study. *BMC Ophthalmol*. 2013;13(1):20.
14. Sudharshan S, Kaleemunnisha S, Banu AA, Shrikrishna S, George AE, Babu BR, et al. Ocular lesions in 1,000 consecutive HIV-positive patients in India: a long-term study. *J Ophthalmic Inflamm Infect*. 2013;3(1):2.
15. Kumari K, Titiyal G. Study of ocular manifestations in HIV positive patients at a tertiary care center in Kumaon region. *Indian J Clin Exp Ophthalmology*. 2017;3(2):166–72.
16. Sahoo S. HIV- and AIDS-related Ocular Manifestations in Tanzanian Patients. *Malays J Med Sci*. 2010;17(1):12–6.

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