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Original Research Article

Prevalence of post-operative complications after cataract surgery in patients with acquired immunodeficiency syndrome (AIDS)

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ABSTRACT

Aim: To estimate the prevalence of post-operative complications after cataract surgery in AIDS patients having cataract in a tertiary care hospital.
Study Design: This was a prospective and observational study done on 100 eyes of 70 AIDS patients having cataract with CD4+ cell count below 200 cells/mm^3 who underwent cataract surgery from December 2021 to November 2022.
Materials and Methods: All the AIDS patients who are having cataract with CD4 cell count below 200 cells/mm^3 were examined for anterior and posterior segment using Slit lamp biomicroscopy and Indirect ophthalmoscopy.
Results: The prevalence of post-operative complications were seen in 3% (3/100) of eyes after cataract surgery. Patients with post-operative complications were in between 46-65 years of age. Post-operative complications were seen in patients with CD4 count between 51-150 cells/mm^3. All the patients underwent postoperative visual acuity of better than 6/24.
Conclusion: In emergency cases cataract surgery in HIV patients is generally safe, regardless of CD4 count, but their general and ocular health should be optimized preoperatively.

1. Introduction

Acquired immunodeficiency syndrome (AIDS) is a chronic multi-systemic immune disorder caused by the human immunodeficiency virus (HIV). It belongs to family retroviridae and subfamily lentivirinae.[1]

(AIDS) have been a frightening pandemic of global concern since it reported the first case in Los Angeles in 1981. The first description of ocular manifestations was made by Maclean more than 20 years ago.[2]

HIV is a retrovirus which replicates in CD4+ T lymphocytes. HIV weakens the immune system and makes the body more susceptible to a host of illnesses by attacking these CD4 cells. Transmission occurs by exposure to blood and other body fluids. The Centers for Disease Control and Prevention (CDC) defines AIDS patient as 'any HIV infected individual with CD4 T-cell count less than 200 cells per cubic millimeter regardless of the presence of symptoms or opportunistic diseases'.[3,4]

HIV/ AIDS patients suffer from many complications due to the immunocompromised state. No organ of the body is spared from the virus or related diseases. Ophthalmic manifestations mostly occur in 50-75% patients at some point during their lifetime. It can be due to vascular abnormalities, opportunistic infections, neuro-ophthalmic conditions, neoplasms or adverse effects of medications along with individual factors such as genetic predisposition, gender and age. The ocular manifestations can be the presenting sign in an otherwise asymptomatic HIV-positive person.[5]

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Opportunistic infections (OI) typically occur when the CD4 count drops below 200 cells per cubic millimeter. Ocular lesions due to opportunistic infections has been declined with the advent of HAART.[6]

1.1. Epidemiology

According to World Health Organization, Since the beginning of the epidemic, 84.2 million [64.0–113.0 million] people have been infected with the HIV virus and about 40.1 million [33.6–48.6 million] people have died of HIV.

It is shown that 15,000 to 20,000 new infections do occur every day. More than 1 million children are infected with HIV in which about three-quarters are assumed to develop HIV associated ocular disease. Studies suggest that between 5 to 25% of all HIV patients in developing countries may become blind in their lifetime. Retina and Choroid are most commonly affected in HIV patients, which is more responsible for causing visual loss.[5,7]

2. Materials and Methods

This was a prospective and observational study, done on 100 eyes of 70 AIDS patients having cataract with CD4+ cell count below 200 cells per cubic millimeter who had cataract surgery at a tertiary care hospital from December 2021 to November 2022. Informed written consent was taken from all the patients enrolled in this study in the local language. Patients identity and details were maintained strictly confidential.

All the patients were examined for anterior and posterior segments by using Slit lamp biomicroscopy and Indirect ophthalmoscopy. The procedure was explained and those gave consent were recruited in this study and the following examinations were done:

1. Visual acuity measurement both unaided and pinhole by Snellen's chart and illiterate charts
2. Color vision with Ishihara charts
3. Anterior segment examination with Slit lamp biomicroscopy.
4. Fundus examination with 90D lens using Slit lamp biomicroscopy and with 20D lens using Indirect ophthalmoscope.
5. Medical records of the patient were observed to obtain information on systemic diseases, HIV status, CD4 counts and anti-retroviral therapy.
6. Random blood sugar, blood pressure recorded.
7. Viral markers.
8. Intraocular pressure measurement by Non-contact tonometry.
9. Syringing done to check the patency of nasolacrimal duct.
10. Keratometry
11. Ultrasound A-scan to calculate axial length and intraocular lens power
12. Ultrasound B-scan
13. Xylocaine sensitivity test
14. The fundus findings were documented using Fundus camera photography.

2.1. Inclusion criteria

1. Patients diagnosed with AIDS having cataract and CD4 cell count below 200 cells/cubic millimeter.
2. Patients of all ages were recruited.

2.2. Exclusion criteria

1. Patients with ELISA-negative (HIV-negative) were excluded from the study.
2. Patients having anterior and posterior segment disorders either related to or not related to HIV/ AIDS were excluded from the study.

3. Results

A total of 100 eyes of 70 patients were examined in the present study who attended the tertiary care hospital.

The prevalence of post-operative complications were seen in 3% (3/100) of eyes after cataract surgery in which all the findings were seen in anterior segment. All the patients were on HAART treatment.

Age distribution is shown in Table 1.

Table 1: Number of AIDS patients in different age groups

S. No.	Age group	Number of patients N(=100)
1.	<25	0
2.	26-35	5
3.	36-45	20
4.	46-55	30
5.	56-65	15
6	>65	0

Male patients were 54 (54%) and female patients were 46 (46%).(Table 2)

Table 2: Sex distribution

S. No.	Sex	Number of patients N (=100)
1.	Males	54
2.	Females	46

Number of AIDS patients with different CD4 cell counts shown in Table 3.

Number of patients and their Preoperative visual acuity were listed below in Table 4.

Post-operative complications observed after cataract surgery on ophthalmic examination were listed below in Table 5.

Table 3: Number of AIDS patients with different CD4 cell counts

CD4 cell count	Number of patients N(=100)
<50	15
51-100	30
101-150	40
151-200	15

Table 4: Number of patients and their preoperative visual acuity

S. No.	Preoperative visual acuity	N(=100)
1.	6/36	15
2.	6/60	15
3.	CF 3m	25
4.	CF 1m	20
5.	HM +	15
6.	PL +	10

Table 5: Post-operative complications after cataract surgery and the number of patients affected

S. No.	Postoperative complications	N=3(3%)
1.	Moderate Uveitis	2 (2%)
2.	Exudative membrane	1 (1%)

All the AIDS patients with CD4 cell count below 200 cells per cubic millimeter who underwent cataract surgery gained vision postoperatively better than 6/24. Number of patients and their postoperative visual acuity were listed below in Table 6.

Table 6: Number of patients and their postoperative visual acuity

S. No.	Postoperative visual acuity	N(=100)
1.	6/24	10
2.	6/18	15
3.	6/12	55
4.	6/9	15
5.	6/6	5

4. Discussion

Acquired immunodeficiency syndrome (AIDS) is a chronic, potentially life-threatening condition caused by the human immunodeficiency virus (HIV). It infects and replicates in helper T cells and macrophages and utilizes CD4 cells and a chemokine coreceptor for entry. Immune deficiency occurs resulting in opportunistic infections and malignancy.[8]

Prevalence of AIDS related ocular Complications were more in males. Prevalence of postoperative ocular complications is not correlating with CD4 count.

There are no previous studies which shown the post-operative complications after cataract surgery in AIDS patients particularly with CD4 cell count below 200 cells per cubic millimeter.

In a study conducted by Grace W. M. Chew et al, who analyzed the outcomes of cataract surgery in patients with acquired immunodeficiency syndrome, had no ophthalmic manifestations in 41.3% of HIV/AIDS patients, only 13.6% patients had postoperative complications like prolonged inflammation, Cytomegalovirus retinitis and rhegmatogenous retinal detachment. There were no cases of endophthalmitis or cystoid macular edema. Postoperative improvement of at least two Snellen lines was achieved in 86.6% of eyes.[9,10]

As per Miller et al. 57 patients (28.5%) had ocular manifestations, and they showed significant lower CD4+ T cell count than patients without ocular manifestations. More ocular manifestations were noticed with decreasing CD4+ counts.[11,12] But there was no significant linear trend in the HIV positives with decreasing CD4+ counts as per the study of Dilys Morgan et al.[13,14]

In this study, there are 3% reported cases of prolonged postoperative inflammation which subsequently subsidised after treatment.

In a study conducted by Jonathan Halim et al, they reported 6.6% cases in normal individuals developing post-operative uveitis.[15]

In this study, as the patients general condition is fair, having no preoperative anterior or posterior segment complications, there are less reported postoperative complications.

Since all the patients were on HAART therapy, the incidence of postoperative complications in patients with AIDS having CD4 count less than 200 are relatively less.

In cases of emergency, like in mature and hypermature cataracts, we can go for a cataract surgery regardless of the CD4 count.

Due to more vision threatening complications, all AIDS patients must undergo regular ophthalmic examinations and also should receive prompt and efficient ophthalmic care. Clinicians also should screen for HIV in the presence of sexually transmitted infections.

With the advent of HAART and third line ART treatment, many of the ocular manifestations are now less common. Early recognition is important so that appropriate therapy can be instituted. Immune system recovery following initiation of antiretroviral therapy (ART) may modify clinical presentation of ocular manifestations and can affect response to treatment.

5. Conclusion

In emergency cases, Cataract surgery in AIDS patients is generally safe, regardless of CD4 count, but their general and ocular health should be optimized preoperatively.

6. Ethical Approval

Authors have obtained all necessary ethical approval from Institutional Ethics Committee, Siddhartha Medical College, Vijayawada.

7. Source of Funding

None.

8. Conflicts of Interest

Nil.

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