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Ocular Disease Burden among HIV Infected Adults in an Urban Kenyan Hospital.

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Abstract:
Background*: Quantification of eye diseases among HIV-infected patients is a step towards the provision of services that improve the quality of life. Traditionally, HIV care was founded on principles of patients' survival and prolonging life expectancy. These principles of HIV medicine practice have shifted from survival to improving the quality of life among the affected population. More HIV patients are living long enough to experience the ocular toxicity of antiretroviral drugs and age-related eye conditions. Co-morbidity of HIV infection with Non-communicable diseases like hypertension, diabetes, and cancers, among others, are contributing to damaging effects of the eye. Since there were no recent equivalent studies carried out in a Kenyan urban clinic, we selected this study to quantify eye diseases among this population. HIV-infected Urban dwellers have additional risk factors for the development of eye diseases like lifestyle and economic activities among many other factors.*
Materials and Methods*: Cross-sectional study design was used on 161 study participants. Structured questionnaires were administered to assess common known risk factors related to demographics and past medical history. This was accompanied by visual acuity testing using the Snellen's chart. Torch examination was done to examine external eye structures. Tropicamide was used to dilate pupils to allow direct fundoscopy.*
Results*: Prevalence of eye diseases was found to be 60.2% among the study participants (N=161). Refractive errors were the commonest eye disorder at 26.7%. Presbyopia was found to be the most prevalent refractive error affecting 52% of all refractive error cases.*
Conclusion: *Refractive errors are significant medical conditions among HIV infected population. Age-related eye conditions, in this case, presbyopia, were found to be common among HIV-infected adults who live longer due to the use of antiretroviral drugs.*
Key Word*: Ocular Disease; Adult; HIV; Kenya;*

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I. Introduction

The lifetime risk of an HIV patient developing at least one abnormal ocular lesion ranges from 52% to 100%. Unusual neoplasm, such as lid or conjunctiva involvement by Kaposi sarcoma and ocular or orbital involvement by high-grade lymphomas may occur (Biswa & Madhavan, 2000). The first publication of typical ocular manifestation among infected patients was done a year later after the discovery of HIV. In the publication, presentations of HIV in the eye were described as cotton wool spots, cytomegalovirus, periphlebitis, and conjunctiva Kaposi sarcoma (Holland, 1982) (Nyaga, 1995). In South Saharan Africa, the prevalence of ocular diseases in HIV positive individuals was between 30%-45% (Acyclovir for the Prevention of Recurrent Herpes Simplex Virus Eye Disease, 1998). A study in Ethiopia showed that the occurrence of at least one ocular manifestation was estimated between 32%-60% among HIV patients (Giorgis, 2007). Ocular Study done in a series of AMPATH clinics in western Kenya revealed that 77% of the patients seeking HIV care have some form of ocular manifestation (Listo, Kollmanm, & Owino, 2009). Studies done in Kenya at Kenyatta National hospital by Nyaga in 1995 got a prevalence of ocular manifestation of HIV in children to be 31% (Nyaga, 1995). Anwan did a similar prevalence study on an adult population in 1990 and found a prevalence of 66% (Anwan, 1990). There has been some publication that reported an increase in the incidence of eye disease among HAART users, Mvongo et al pointed out that, Use of ARV has been seen to increase the prevalence of ocular diseases among HIV patients (Mvongo & Ellong, 2007). A study done in Ethiopia's Felege Hiwot hospital found out the most prevalent ocular condition among HIV patients to be squamoid type conjunctiva growth (Guadie & Muluken, 2015). A study in Zimbabwe also revealed ocular surface squamous neoplasm to be the commonest tumor of the ocular surface whose primary site is the conjunctiva (Pola, Masaganise, & Rusakaniko,

2003). In immune-compromised patients, Human papillomavirus is the cause of OSSN. In a study that evaluated 38 OSSN specimens from Kenya and Uganda HIV infected patients, HPV 18 was seen by PCR analysis in 23 out of 38(61%) specimen and double genotype HPV 16 in another six (16%) tumor specimens (Yu, Fu, & Pink, 2010). More of our HIV patients are now living to old age and it is our duty as healthcare workers to start dealing with their new challenges that come with age and long-term use of HIV antiretroviral drugs (Espositos, Porta, Bojanin, Gualtieri, Vismara, & Principi, 2006).

II. Material And Methods

This cross-sectional study was carried out at Kenyatta National Hospital, HIV clinic from July 2018 to October 2018. A total of 161 participants, aged between 18 years and 70 years, were interviewed and subjected to the medical eye examination. Permission was sought from the hospital ethics and research committee, reference UP260/04/2018.

Study Design: Cross-sectional study design

Study Location: Kenyatta National Hospital, comprehensive care center. Clinic caring for HIV infected individuals.

Study Duration: July 2018 to October 2018

Sample size: 161 patients.

Sample size calculation: A convenient study size of 161 participants was randomly selected with the help of an electronic queuing machine. The process was carried out daily amongst patients scheduled for a clinic appointment. **Subjects & selection method**: The study population was drawn from HIV positive patients attending the Kenyatta National Hospital HIV clinic. Upon arrival, each patient was issued a number from a queuing machine, the sampling started by selecting an element from the list at random and then every k^{th} element in the frame was selected, where k was the sampling interval. The k^{th} element was chosen for the study

Inclusion criteria:

1. HV positive patients
2. Either sex
3. Aged 8 years to 70 years
4. Must have up to date lab investigations, CD4 cell count of no more than 6 months, and viral load did within one year from the examination date.
5. Clinic member for more than 6 months

Exclusion criteria:

1. Those patients seeking Pre-Exposure prophylaxis and Post Exposure prophylaxis medicine to prevent HIV
2. Patients outside the prescribed age range
3. Patient too sick to withstand intense medical examination.
4. Medical records are not up to date.

Procedure methodology

After written informed consent was obtained, the following tools were used in data collection as follows:

Questionnaire

Questionnaires were designed to capture various forms of data that described the variables. It was composed majorly of closed-end questions. There was the flexibility of the respondent to express him/herself by filling in some open-ended questions that were mostly conclusions made in a category. Each questionnaire was assigned a prefilled code- which was for accountability purposes. The first part of the questionnaire picked bio-data of the patient. Subsequent sections in the questionnaire were categorized based on study objectives.

Secondary data

Secondary data on patient information was retrieved from the Kenyatta National Hospital HIV clinic database. This data included information on lab results, type of HAART regime in use, duration of use, and date of drug regime change if any.

Observation

This technique was used to pick out some eye presentations that were obvious like ocular surface neoplasm and systemic diseases manifesting in the eye.

Examination pen torch

A light source is essential in an eye exam. This instrument was used for the external eye and anterior segment examination of the eye. Pupil reaction in response to light stimulation helped the researcher rule out some neurological disorders manifesting through the eye. Light source was instrumental in performing the Hirschberg test to check for strabismus.

Visual acuity chart

Every patient was subjected to visual acuity testing. This marked the beginning of the medical examination. Patients were directed in a well-illuminated room, positioned 6 meters away, and using standard Snellen's chart or E chart, visual acuity was measured. The inability to read large print of the chart at 6 meters required the patient to move closer to the visual acuity chart as required by the standard procedure. Failure to improve with this intervention prompted the examiner to ask the patient to count fingers. Further inability to count fingers required the examiner to evaluate more by assessing vision through hand movement and lastly perception of light.

Direct Ophthalmoscope

Ophthalmoscopy is an examination procedure used to visualize the posterior chamber. This was used to get details of the vitreous, retina, macula, and optic disc.

Cotton wool applicator

This was helpful in averting the upper lid when examining palpebral conjunctiva. It was also used to wipe off any eye discharge to allow examination.

Pinhole occlude

It was used for a vision that was worse than 6/18. A pinhole compensates for uncorrected refractive error by allowing only light rays near the axis/central to pass through to the retina without needing refraction.

Tropicamide and phenyl ephedrine

They were important in preparing a patient for ophthalmoscopy. They dilated the pupils to allow fundus visualization.

Patients identified to be suffering from the ocular disease were treated and given a drug prescription. Those with complicated medical conditions were issued with a consult/referral forms to Kenyatta national hospital eye unit for further evaluation and management.

Statistical analysis

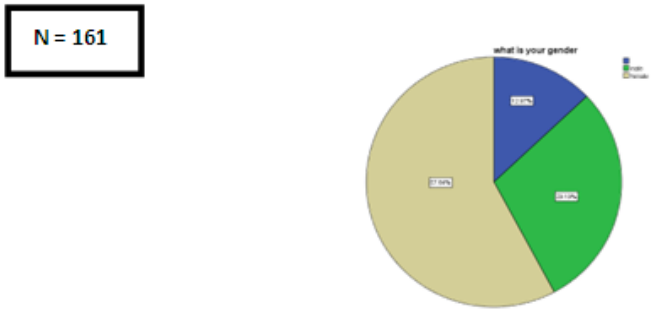
Data were analyzed using SPSS version 20.

III. Result

Gender distribution

A total of 161 study participants were interviewed and subjected to medical eye evaluation. Out of this number, 107 were female and 54 were males. This represents 66.5% females and 33.5% males.

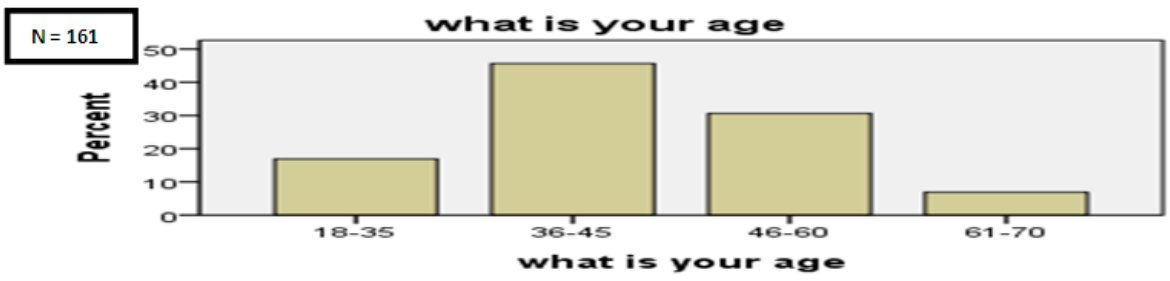
Figure 1: Gender distribution of the sample



Age distribution

Age group 36-45 years were 73 in number which translated to 39.5%, this age group formed the majority of the participants. Age group 61-70 years was the least with only 6.9% of the total number.

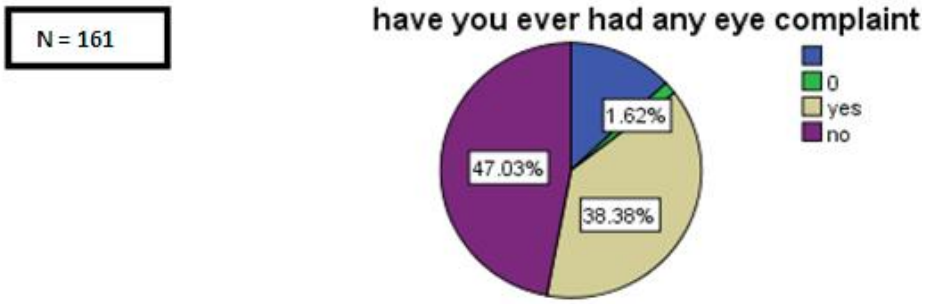
Figure 2: Bar graph showing the age distribution



Eye complaint

Among the study population, only 38.38% of the population reported being having eye complaints on the day of data collection. While 47.03% did not report any eye complaints. The remaining 1.62% had previously been treated with eye diseases or did not respond to the question.

Figure 3: Pie chart showing the distribution of those with eye complaints



History of spectacles use, eye surgery, eye allergies/eye diseases, and current use of medical eye drops

Individuals on prescription only spectacle use, stood at 24.3%, while 61.5% did not use spectacles. Only 5 people admit to having undergone eye surgery which represents 2.7% of study participants. At the time of the visit, 3.8% of individuals were on medical eye drops while 29.7% reported a positive history of eye allergies and diseases.

Figure 4: Pie chart showing the distribution of family history of eye diseases

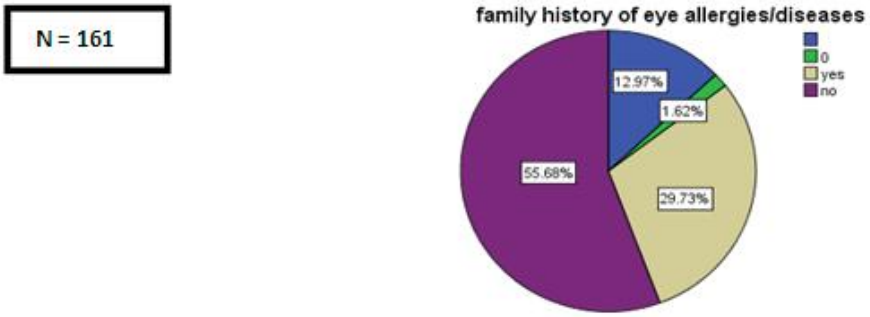
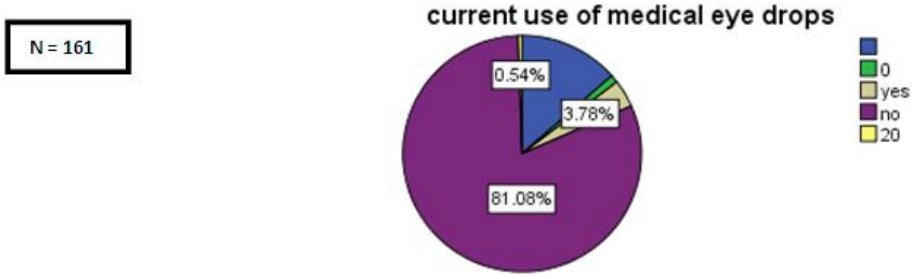


Figure 5: Pie Chart showing the distribution of those on medical eye drops



HIV/HAART history

The majority of the study participants had been living with HIV between 6 to 10 years. This represents 33.5% of the participants. Those who had lived more than 10 years were 29.8%, 0-1 year were 16% while 1-5 years were 20.5%. Most participants had used HAART for a period of 6-10 years which represented 33.8%. It was found 25.6% of the participants had taken HAART for 1-5 years. Those who had taken medication for more than 10 years were 23.8% and those who had taken drugs for 0-1 year were 16.9%. There were 89.4% of study participants on first-line HAART, 9.4% were on the second line and 0.6% on the third line.

Figure 6: Bar graph showing the length of time one has lived with HIV disease

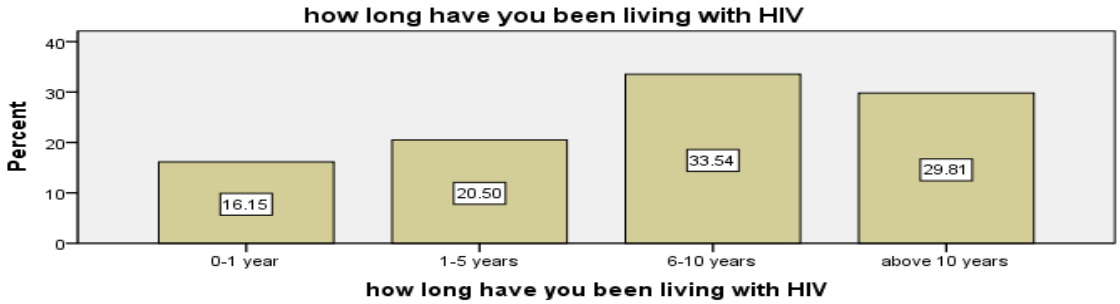
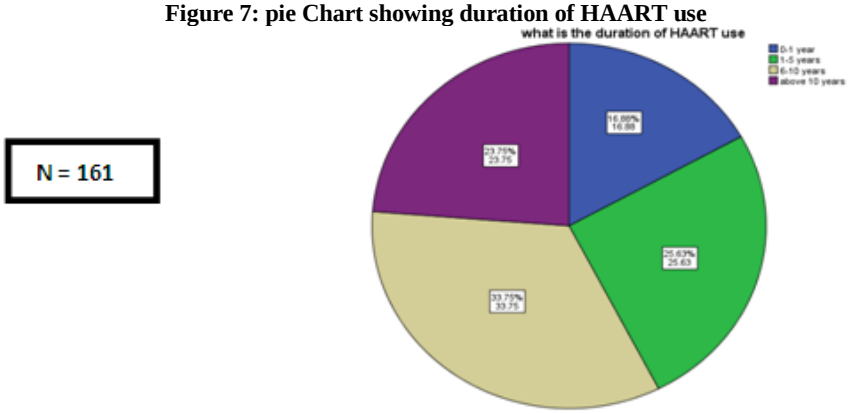


Figure 7: pie Chart showing duration of HAART use



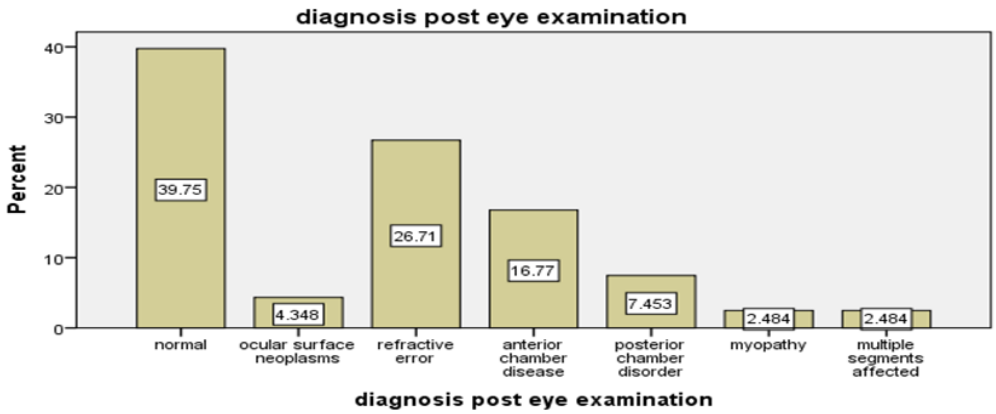
Eye examination and diagnosis

Diagnoses made from eye examination were broadly classified according to the segment of the eye involved. These classifications were as follows:

- Ocular surface neoplasia
- Refractive error
- Anterior segment disorder
- Posterior segment disorder
- Myopathy
- Multiple segments affected

Refractive error was found to be the most common ocular condition among the study population with a prevalence of 26.7%. The number of those who had normal ocular exams was 64 which represented 39.8%. This means the prevalence of the ocular condition among this population was 60.8%

Figure 8: Bar graph showing diagnosed eye diseases



IV. Discussion

A total number of 161 study participants were subjected to a medical eye exam and out of this number 107 were female and 54 were males which represented 66.5% females and 33.5% males. Among 161 participants, 64 had a normal eye examination. This represented 39.8% of normal individuals, the remainder who were 97 in number; represented 60.2% had some form of eye pathologies. For this reason, the statistical

burden of ocular disease within the study group was 60.2%. This was in harmony with a study done in Ethiopia, which showed the occurrence of at least one ocular manifestation to be between 32%-60% among HIV patients (Giorgis, 2007). Anwan did a prevalence study among HIV infected adult population at Kenyatta National Hospital and got a prevalence of 66% (Anwan, 1990). Findings from this study contradicted a study done in 2004 that the estimated prevalence of eye disease in south-Saharan Africa to be 30%-45% (Goldberg, Smithen, Angelilli, & Freeman, 2004).

Refractive error was singled out as the commonest eye disorder among patients attending Kenyatta National Hospital with a prevalence of (43 cases) 26.7% of the study population. Presbyopia was classified as a refractive error in this study and it accounted for (25 cases) 52% of all refractive error cases (48 cases). In the HAART era, HIV-infected individuals are living longer, and for this reason, age-related conditions including presbyopia are becoming more common among this group. The total number of refractive errors rose from 43 to 48 since some study participants had multiple eye diseases.

Vision impairment came in as the second cause of the refractive error with 18 (48%) of the 48 participants recording visual acuity of 6/18 or worse on either or both eyes. In a 2013 study done in Ethiopia by Sisay Bekele et al, it found 97.23% of study participants had visual acuity of >6/18 in either or both eyes (Bekele, Yeshigeta, & Fasil, 2013) , this prevalence was higher compared to 48% that was found in this study. Anterior segment disorders affected 27 individuals which contributed to16.8% of all study participants. A study by Bekele et al had a prevalence of anterior segment disorder at 12.3% (Bekele, Yeshigeta, & Fasil, 2013).

Anterior segment disorders were found to be the second most affected part of the eye among the study population. Conjunctivitis affected 14 of the 27 study participants with anterior segment disorders; this gave a prevalence of 51.9% while Dry eye syndrome accounted for 22.2% of cases. This prevalence is similar to another study that recorded a prevalence of 10%-20 % (Bekele, Yeshigeta, & Fasil, 2013). Posterior segment disorders were slightly higher at 7.5% compared to 5% found in a study done in Ethiopia (Bekele, Yeshigeta, & Fasil, 2013). Gondar university hospital study had a prevalence of 9.6% which is higher than what was found in this study (Yared, Asfwessen, & Azanaw, 2006).

V. Conclusion

The prevalence of eye diseases among HIV-infected adults aged 18 years to 70 years is 60.2%. Refractive errors are the commonest eye disorder among HIV infected adults with a prevalence of 26.7%. Presbyopia affects 52% of all refractive error cases, thus making it the commonest refractive error among HIV infected adult population.

(Placeholder11) (AFYA360, 2017)

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