

# Ocular manifestations in HIV-AIDS patients in a Nigerian community

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## Abstract

**Background:** The aim of this study was to determine the ocular manifestations of human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS) among the study population.

**Method:** A cross-sectional descriptive study was conducted among HIV-AIDS patients at the Federal Medical Centre, Owo, Nigeria. Ethics clearance was obtained from the ethics review committee of the hospital. Informed consent was obtained from all the respondents. This study was conducted over a period of nine months, from October 2010-June 2011, at the medical outpatient centre and the eye clinic of the hospital. The obtained information included the socio-demographics of the respondents, World Health Organization clinical stage of AIDS, CD4 count, duration of HIV-positive status, history of ocular problems and the treatment sought.

**Results:** A total of 112 consenting respondents participated in this study. Not many respondents (36, 32.1%) were aware of eye complications that relate to HIV-AIDS. Most informed respondents had been enlightened by health workers (20, 55.6%). Few respondents (16, 14.3%) had HIV-AIDS ocular manifestations. Squamous cell carcinoma was the most common ocular manifestation.

**Conclusion:** Efforts should be made to promote the ocular health of HIV-AIDS patients to prevent blinding ocular manifestation.

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## Introduction

Since the first case of acquired immunodeficiency syndrome (AIDS) was diagnosed in 1981, the cases of human immunodeficiency virus (HIV) infection have been increasing worldwide.<sup>1</sup> It has been reported that since 1981, > 25 million people have died of the disease.<sup>2</sup> In 2007, the estimated number of people living with HIV-AIDS was 33 million (30.3-36.1 million).<sup>2</sup> People < 25 years old account for half of all new HIV infections.<sup>2</sup> By the end of 2007, women accounted for 50% of all adults living with HIV worldwide, and for 59% in sub-Saharan Africa.<sup>2</sup> In sub-Saharan Africa, HIV-AIDS constitutes a huge burden on limited financial, medical and human resources.<sup>3,4</sup> The first HIV case in Nigeria was reported in 1986.<sup>5</sup> Since then, many Nigerians have been infected with HIV. The national seroprevalence of HIV in Nigeria is estimated to be 4.4%.<sup>6</sup>

The challenge posed by HIV-AIDS is enormous. AIDS is a disease with protean clinical manifestations that affect all

body organs.<sup>7</sup> Eyes are also affected by HIV-AIDS. Between 5-25% of all HIV-infected patients in developing countries may develop blindness at some time during their illness.<sup>8</sup> AIDS patients should be monitored closely for signs of opportunistic ocular disease which may be asymptomatic initially.<sup>9</sup> The eyes are affected in 70% of HIV-AIDS patients.<sup>7</sup> HIV-infected patients can be infected with a large variety of microorganisms, e.g. viruses, bacteria and fungi, which can cause ocular diseases.<sup>10</sup> These disorders can be divided into microvasculopathy, large-vessel disease, opportunistic infectious disease, neoplasms and neuro-ophthalmic signs of intracranial disease. Ocular tuberculosis, syphilitic retinal disease and ocular toxoplasmosis are acute eye problems that are seen in HIV patients, especially in developing countries.<sup>10</sup> The patterns of ocular diseases in HIV-infected patients in developed countries differ from those in developing countries.<sup>8,11,12</sup> Antibodies against cytomegalovirus (CMV) are detectable in 90% of people living with HIV-AIDS, but CMV retinitis is rare (< 5%) in

AIDS patients in developing countries.<sup>13,14</sup> Variation in the manifestation of ocular AIDS in developed and developing countries is presumed to be due to the early and high mortality rate in people living with HIV-AIDS in developing countries. This is coupled with differences in HIV subtype, race, as well as the influence of co-morbid diseases.<sup>8,11,15</sup>

Ophthalmologists should be familiar with the signs and symptoms of eye disease and have a broad knowledge of HIV-AIDS<sup>10</sup> in order to be able to make a good diagnosis, and then offer suitable treatment to HIV patients with ocular disease. Patients with AIDS face challenges and limitations, including having visual complications of the disease. Appropriate preventive and curative measures should be introduced in different health services. It is imperative to determine the profile of ocular problems in ophthalmology services that provide care to patients with HIV-AIDS. The increasing availability and use of highly active antiretroviral therapy (HAART) in countries like Nigeria is likely to alter the distribution pattern of ocular diseases in HIV-positive patients. On the one hand, both the life expectancy and prevalence of ocular complications could be expected to increase, while on the other, the prevalence might actually decrease because of better immune competence. For instance, immune recovery uveitis occurs in HIV-AIDS patients with a history of CMV retinitis who experience immune reconstitution due to HAART.<sup>16</sup>

This study was designed to determine the ocular manifestations in HIV-AIDS patients presenting to the Federal Medical Centre, Owo, Ondo State, Nigeria. No similar study has yet been carried out in this hospital. It is hoped that the findings of this study will help policymakers to develop strategies to address the challenges posed by HIV-AIDS, and the accompanying ocular complications.

## Method

This cross-sectional descriptive study was conducted at the Federal Medical Centre, Owo, Nigeria, among HIV-AIDS patients. Ethical clearance was obtained from the ethical review committee of the hospital prior to commencement of this study. Informed consent was obtained from all the respondents. The study was conducted over a period of nine months, between October 2010-June 2011, at the medical outpatient centre and the eye clinic at the hospital. All consenting, newly registered HIV-AIDS patients who presented to the hospital during the study period were enrolled, irrespective of whether they were on HAART or not. The respondents were interviewed by means of the study instrument, namely a semi-structured questionnaire. The authors and three trained research assistants conducted the interviews. The obtained information was the biodata of the

respondents, World Health Organization (WHO) clinical stage of AIDS, cluster of differentiation 4 (CD4) count, duration of HIV-positive status and history of ocular problems. The duration of HAART was ascertained. All the respondents underwent a comprehensive ocular examination, including dilated fundoscopy, performed by some of the authors. The obtained data were collated and analysed with Statistical Package for Social Sciences® 15.0.1.

## Results

One hundred and twelve respondents participated in this study. The ages of the respondents were 9-73 years, with a mean age of 40 years  $\pm$  11.3 years. The respondents included 26 males (23.2%) and 86 females (76.8%). The ethnic distribution of the respondents was 95 (84.8%) Yoruba, 6 (5.4%) Ibos and 1 (0.9%) Hausa. The other ethnic groups accounted for the remaining 10 (8.9%). Most respondents were married (86, 76.8%), 19 (17%) were single, and the others (7, 6.3%) were widowed. The majority of the respondents (107, 95.5%) were Christians. The remainder (5, 4.5%) were Muslims. Most of the respondents were traders (47, 42%). See Table I.

**Table I: Occupations of the respondents**

| Occupation    | Frequency | Percentage |
|---------------|-----------|------------|
| Trader        | 47        | 42         |
| Civil servant | 23        | 20.5       |
| Artisan       | 20        | 17.9       |
| Farmer        | 9         | 8          |
| Unemployed    | 7         | 6.3        |
| Scholar       | 4         | 3.6        |
| Pensioner     | 1         | 0.9        |
| Clergyman     | 1         | 0.9        |
| Total         | 112       | 100        |

Clinical stage of the disease were Stage 1: 39 (39.8%); Stage 2: 18 (18.4%); Stage 3: 36 (36.7%); and Stage 4: 5 (5.1%).

CD4 count/ $\mu$ l was 000: 9 (9%); 500-1 000: 27 (27%); 200-500: 51 (51%); and < 200: 13 (13%).

Most of the participants were on HAART (103, 92%), while 9.8% were not.

Duration on HAART was < 1 year: 24 (23.3%); 1-3 years: 50 (48.5%); 3-5 years: 21 (20.4%); and 5 years: 8 (7.8%).

### History of eye problems

Only 14 (12.5%) had a history of eye problems. The majority (97, 86.6%) did not have a history of eye problems, and the remaining 1 (0.9%) was unsure.

### Awareness of HIV-/AIDS-associated eye manifestations

Only 36 (32.1%) were aware of HIV-/AIDS-associated eye complications. Seventy-six (67.9%) were unaware of HIV-/AIDS-associated eye manifestations. Most respondents who were informed stated that health workers had told them about this. The sources of information on HIV-/AIDS-associated ocular manifestations are tabulated in Table II.

**Table II:** Sources of awareness on HIV-/AIDS-associated ocular manifestations

| Source                      | Frequency | Percentage |
|-----------------------------|-----------|------------|
| Health worker               | 20        | 55.6       |
| Person living with HIV/AIDS | 10        | 27.8       |
| Media                       | 3         | 8.3        |
| Lectures and seminars       | 3         | 8.3        |
| Total                       | 36        | 100        |

AIDS = acquired immune deficiency syndrome, HIV = human immunodeficiency virus

### HIV-/AIDS-associated ocular manifestations

Only 16 (14.3%) of the respondents had HIV/AIDS-associated ocular manifestations. The majority's eyes (96, 85.7%) were not affected. Only 6 (37.5%) of the respondents who had HIV/AIDS-associated ocular manifestations were aware of such a concept. The remaining 10 (62.5%) were unaware of it. Details of the HIV-/AIDS-associated ocular manifestations among the 16 affected respondents are shown in Table III. The CD4 count of the respondents did not significantly affect the HIV-/AIDS-associated ocular manifestations ( $p$ -value of 0.154).

**Table III:** HIV-/AIDS-associated ocular manifestations

| Ocular manifestation                      | Frequency | Percentage |
|---|-----------|------------|
| Squamous cell carcinoma                   | 4         | 25         |
| Ocular toxoplasmosis                      | 3         | 18.75      |
| Uveitis                                   | 2         | 12.5       |
| Optic atrophy                             | 2         | 12.5       |
| Papilloedema                              | 1         | 6.25       |
| Herpes zoster ophthalmicus                | 1         | 6.25       |
| Chorioretinitis, apart from toxoplasmosis | 1         | 6.25       |
| Molluscum contagiosum                     | 1         | 6.25       |
| Complicated cataract                      | 1         | 6.25       |
| Total                                     | 16        | 100        |

### Discussion

Most respondents were Yorubas. The study community is mainly a Yoruba community. The majority of respondents were Christians. Christianity is the predominant religion in the community. A few respondents were widowed, due

to the reduced life expectancy of HIV/AIDS concordant couples.

In 2007, the Joint United Nations Programme on HIV/AIDS estimated that in Nigeria, 3.1% of adults aged 15-49 years, were living with HIV/AIDS.<sup>17</sup> Approximately 170 000 people died from AIDS in 2007.<sup>17</sup> Life expectancy in Nigeria has declined as AIDS has claimed so many lives. Despite the fact that Nigeria is the largest oil producer in Africa, and the twelfth largest in the world,<sup>18</sup> it is ranked 158 out of 177 on the United Nations Development Programme Human Poverty Index.<sup>19</sup> This poor economic position means that Nigeria is faced with huge challenges in fighting the HIV/AIDS epidemic.

To date, most studies on the prevalence of HIV-/AIDS-associated ocular complications have been carried out in industrialised countries, although > 90% of all patients with HIV live in developing countries.<sup>8</sup> Ocular findings represent the late stages of the disease (AIDS). These findings include ocular opportunistic infections, such as herpes zoster ophthalmicus, CMV retinitis, Kaposi's sarcoma and squamous cell carcinoma of the conjunctiva.<sup>20-22</sup>

In this study population, the HIV-/AIDS-associated ocular manifestations were relatively low compared with the findings of a study carried out in Ethiopia by Assefa et al. They reported a prevalence of 60% in their study population.<sup>7</sup> The higher prevalence of HIV-/AIDS-associated ocular manifestations in the latter study might relate to the fact that 90% of their respondents were classified as WHO Stages 3 and 4. Studies carried out in Burundi and Malawi have revealed a prevalence of HIV-/AIDS-associated ocular manifestations of 19% and 20%, respectively.<sup>12,14</sup> Another Nigerian study, carried out by Kehinde et al, reported HIV-/AIDS-associated ocular manifestations in 12.3% of their study population.<sup>23</sup> In a similar study conducted in India among HIV/AIDS patients on HAART, only eight per cent of the study population had ocular manifestations of the disease.<sup>16</sup>

HIV-/AIDS-associated ocular manifestations tend to occur most commonly when the CD4 count drops to < 50/ $\mu$ l. Few respondents had a CD4 count < 200/ml. This is most likely to be the reason for the relatively low incidence of HIV-/AIDS-associated ocular manifestations reported in this study. Use of strict antiretroviral therapy, and repopulation of the T-lymphocyte count, has conflicted the role of the lowest CD4 plus T-lymphocyte count as a predictor of the risk of development of HIV-associated disorders.<sup>24</sup> This fact may also explain why the CD4 count of the respondents did not significantly affect the ocular manifestation of the disease among our study population. The fact that most respondents were on HAART is likely to be the reason for their relatively good ocular health.

The most predominant ocular manifestation in this study was squamous cell carcinoma, which was confirmed by histology, after excision of the growth. Umeh<sup>25</sup> from Enugu in Nigeria, and Adegbehingbe<sup>26</sup> from Ife in Nigeria, reported that four out of six patients with herpes zoster ophthalmicus who presented at their hospitals were HIV-positive. Osahon carried out a study in Benin, and reported that three out of four patients with herpes zoster ophthalmicus were HIV-positive.<sup>27</sup> Kehinde et al reported that herpes zoster ophthalmicus was the most predominant ocular manifestation in their study population.<sup>23</sup> Yet another Nigerian study, carried out by Nwosu et al, reported that 4 (5.3%) out of 76 ophthalmic patients were HIV-positive. Seventy-five per cent of these had herpes zoster ophthalmicus and 25% had uveitis.<sup>28</sup>

Most of the respondents who were aware of HIV/AIDS-associated ocular manifestations were informed by health workers. This finding reinforces the role of eye healthcare providers in ensuring that patients with HIV/AIDS are well informed about their ocular health. This would go a long way towards promoting eye health among patients with HIV/AIDS. The media has made little contribution to enlightening respondents about their ocular health. It should play a more prominent role in disseminating messages with regard to eye health, especially among people living with HIV/AIDS.

## Conclusion

Not many respondents were aware of HIV/AIDS-associated ocular manifestations. Health workers played a prominent role in informing respondents who were aware of HIV/AIDS-associated ocular manifestations. Few respondents had HIV/AIDS-associated ocular manifestations. In this study, squamous cell carcinoma was the most predominant HIV/AIDS-associated ocular manifestation.

## Recommendations

Attention should be paid to the ocular health of HIV/AIDS patients.

There is need to create awareness among affected individuals about HIV/AIDS-associated ocular manifestations. In this study, only a few of those who were affected were aware of such a concept. The general public should also be educated on HIV/AIDS-associated ocular manifestations.

Highly active antiretroviral therapy should be made readily available, so as to improve the immune status of affected patients, resulting in better ocular health.

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