

Research Article

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Visual Status and Causes of Low Vision and Blindness among HIV/AIDS Patients in Yenagoa, Bayelsa State, Nigeria

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Abstract

Background of study: The visual status and causes of visual impairment among HIV/AIDS patients in Yenagoa is not yet determined. In order to optimize the gain of an effective HIV/AIDS control programme, this information is vital.

Aim/Objectives: To determine the visual status and causes of visual impairment among HIV/AIDS patients in Yenagoa, Bayelsa state, Nigeria.

Method: A prospective cross sectional study was carried out on new consecutive HIV positive patients presenting to the "heart to heart" clinic of the Niger Delta University Teaching Hospital, Okolobiri over a period of 16 months. Relevant history was obtained from the patients and their base line data such as age, sex and CD4 count was recorded. The patients underwent a full ophthalmic examination including visual acuity assessment and an anterior and a posterior segment examination.

Result: One hundred and thirty nine patients (139), was evaluated consisting of 91 males and 48 females (M/F ratio of 1:1.9). 15(10.8%) had visual impairment while 124(89.2%) had normal vision. Eighty (80 %) of patients with visual impairment was found to be blind while 20% had low vision. Eighty percent (80%) of patients with visual impairment has CD4 counts of 300 cells/μl or less. Retrobulbar optic neuritis was the commonest cause of blindness (33.4%) followed by cataract (24.9%) and maculopathy (16.7%). Cytomegalovirus retinitis, herpes zoster ophthalmicus and toxoplasmosis were each responsible for 8.3% of blindness.

Conclusion: The visual status of this population was generally good. For a few with visual impairment, it was largely due to retrobulbar optic neuritis and cataract. Improvement of the visual status of this population must pay priority attention to these diseases.

Keyword: Blindness; Visual status; HIV/AIDS

Introduction

In 1981, the first case of HIV/AIDS infection was reported in the United States of America (USA) [1]. Since then the pandemic had taken a toll on the human race with diverse social and economic consequences and above all a potential for visual loss and ultimately blindness.

In north America and Europe, prior to the introduction of highly active antiretroviral therapy (HAART), it was found that 50 - 75% of HIV infected individuals develop non-refractive visual problems at some point during the course of the illness [2]. In the developing world, 5 - 25% of all HIV positive patients are expected to develop blindness at some point in time during the course of their illness [3]. Undoubtedly, patients with HIV/AIDS especially those in developing countries with poor standard of care are at risk of blindness or low vision. In the pre - HAART era, CMV retinitis was the commonest cause of visual loss in patients with HIV/AIDS infection and was responsible for 1 - 2 million cases of bilateral vision loss worldwide [4]. However, with the widespread introduction of HAART and its attendant positive effect on immune recovery and eventual prognostic outlook on HIV/AIDS infection, other causes of visual loss are increasingly becoming apparent. Macular ischaemia has been found to be responsible for some cases of visual loss in HIV/AIDS infection [5-7]. Ischaemic maculopathy has been found to develop as a severe form of HIV microvasculopathy or as a complication of CMV retinitis [8,9]. A study has found cataract to be responsible for a significant proportion (25%) of vision loss in HIV/AIDS patients [10]. Other causes of reduced vision in patients with HIV/AIDS infection include Herpes Zoster Ophthalmicus, Herpes simplex retinitis, Optic nerve disease, uveitis, refractive errors, glaucoma and diabetic retinopathy [3,11].

As part of the holistic intervention to the HIV/AIDS pandemic, visual preservation should be accorded a priority in order to optimize the gains of these interventions. In order to achieve this goal of visual preservation, it is necessary to know the visual status of these patients and the cause(s) of visual loss when it does occur. This information is largely unavailable in Bayelsa State, Nigeria. This study was therefore undertaken to provide this essential knowledge needed for the optimal care of HIV/AIDS patients in this population.

Materials and Methods

Duration and place of study

The study took place over a period of 16 months at the eye clinic of the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State.

Method

A descriptive prospective cross sectional study was carried out on every consecutive new HIV positive patient receiving treatment (HAART) at the Heart to Heart clinic of the Niger Delta University

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Teaching Hospital. Confirmed HIV patients referred from other units of the hospital were also included in this study. Relevant history was obtained from each patient and their baseline data such age, sex, and CD4 count was recorded. Each patient underwent full ophthalmic examination. Their visual acuities were determined at a distance of 6m by a trained ophthalmic nurse with and without Pin hole using snellen acuity chart. Those that showed improvement with pin hole were refracted using a 534 Carl Zeiss auto-refractometer followed by a subjective refraction by an Optometrist. All patients had full ophthalmic examination. The anterior segment was examined using a pen torch and a slit lamp biomicroscope (Haag-strait) while the posterior segment was examined using direct and indirect ophthalmoscope (Keeler) as necessary by an Ophthalmologist(IR).Dilatation of the fund us where necessary was done using 1% tropicamide. All examination was done by one investigator (IR).

Main outcome measures

Blindness (Bilateral) was defined as a visual acuity of less than 3/60 in the better eye, while unilateral blindness was defined as a visual acuity of less than 3/60 in the affected eye.

Low vision (Bilateral) was defined as a visual acuity of less than 6/18 but equal to or greater than 3/60 in the better eye while unilateral low vision was defined as a visual acuity of less than 6/18 but equal to or greater than 3/60 in the affected eye.

Statistical analysis

The data was collated and analysed using the statistical package of social scientist (SPSS) version 16 and a scientific calculator. They were presented as frequencies, percentages, means and standard deviation of means.

Results

During the period of this study, 139 previously diagnosed HIV patients were evaluated. They consisted of 91 females and 48 males (Male: Female ratio of 1:1.9). Their ages ranged from 9 to 66 years with a mean of 36.2 years (SD \pm 10.0), (Table 1).

Of this number, 124 (89.2%) had normal vision, while 15 (10.8%)

| Age(years) | Sex (n) | | Total (n %) |
|------------|------------|------------|-------------|
| | Male | Female | |
| 0 - 10 | 2 (1.44) | - | 2 (1.4) |
| 11 - 20 | - | 2 (1.44) | 2 (1.4) |
| 21 - 30 | 4 (2.88) | 30 (21.58) | 34 (24.46) |
| 31 - 40 | 19 (13.66) | 40 (28.8) | 59 (42.45) |
| 41 - 50 | 13 (9.35) | 14 (10.07) | 27 (19.4) |
| 51 - 60 | 6 (4.31) | 5 (3.6) | 11 (7.9) |
| 61 - 70 | 4 (2.88) | - | 4 (2.9) |
| > 70 | - | - | - |
| Total | 48 (34.52) | 91 (65.49) | 139 (100.0) |

Table 1: Age and sex distribution of study population.

| Visual Status | Type of impairment (n%) | | Total (n%) |
|---------------|-------------------------|------------|------------|
| | Bilateral | Unilateral | |
| Blindness | 2 (12.3) | 10 (66.7) | 12 (79.9) |
| Low Vision | 1 (6.7) | 2 (13.3) | 3 (20.0) |
| Total | 3 (20.0) | 12 (79.9) | 15 (100.0) |

Table 2: Visual Impairment in the Study Population.

| Category / Causes of Blindness | Number | Percent |
|--------------------------------|--------|---------|
| (A)Bilateral blindness | | |
| Retrobulbur optic neuropathy | 2 | 16.7 |
| (B)Unilateral blindness | | |
| Cataract | 3 | 24.9 |
| Retrobulbar optic neuropathy | 2 | 16.7 |
| Maculopathy | 2 | 16.7 |
| Cytomegalovirus retinitis | 1 | 8.3 |
| Herpes zoster ophthalmicus | 1 | 8.3 |
| Toxoplasmosis | 1 | 8.3 |
| Total | 12 | 100.0 |

Table 3: Causes of Blindness in the Study Population.

| Category / Causes of low vision | Number | Percent |
|---------------------------------|--------|---------|
| (A)Bilateral low vision | | |
| Glaucoma | 1 | 33.3 |
| (B)Unilateral low vision | | |
| Uveitis | 2 | 66.6 |
| Total | 3 | 100.0 |

Table 4: Causes of low vision in the Study Population.

had visual impairment. Among patients with visual impairment, 12 (79.7%) were blind in one or both eyes (2 bilateral blindness (13.3%), 10 unilateral blindness (66.7%), while 3 had low vision (20.0%), (Table 2).

Retrobulbar optic neuritis was responsible for 2 cases each of bilateral and unilateral blindness respectively, constituting 33.4% of total blindness, (Table 3).

Cataract was the commonest cause of unilateral blindness and second commonest cause of overall blindness (24.9%), followed by Maculopathy (16.7%). Cytomegalovirus retinitis, Herpes zoster Ophthalmicus and Toxoplasmosis were each responsible for 8.3% of overall blindness in this population.

The cause of low vision in the study population is shown in Table 4. Uveitis was the commonest cause of low vision (66.3%), followed by Glaucoma (33.3%).

Eighty percent of patients with visual impairment have CD4 counts ranging from 0 to 300cells/ μ l, Table 5.

Patients with normal vision had an average CD4 count of 352.9 (SD \pm 249.8) while those with visual impairment had an average CD4 count of 186.7 (SD \pm 163.3).

Discussion

The prevalence of visual impairment among HIV/AIDS patients in this study was found to be 10.8%. This is consistent with 11% found by Otit-Sengeri among HIV patients in Uganda [12] and at variance with 20% and 27% respectively recorded by Pathai et al. [13] and Shah et al. [14], both in India. It has been found that the lower the CD4 count, the more likelihood of a patient suffering from visual impairment compared to a higher CD4 count level [12,14]. This is consistent with our finding as majorities (80%) of patients with visual impairment have CD4 count of 300cells/ μ l or less. The average CD4 count in our study was 269.8 cells/ μ l while those for the studies by pathai et al. [13] and shah et al. [14] was 180 cells/ μ l and 200 cell/ μ l respectively. The higher average level of CD4 count in our study compared to previous authors may be responsible for the lower prevalence of visual impairment recorded. The prevalence of blindness (bilateral and unilateral combined) in this population was found to be 8.6% while that of low vision (bilateral and

| CD4 count | Visual impairment | |
|-----------|-------------------|---------|
| | Number | Percent |
| 0-50 | 2 | 13.3 |
| 51-100 | 4 | 26.6 |
| 101-150 | 2 | 13.3 |
| 151-200 | 1 | 6.7 |
| 201-250 | 1 | 6.7 |
| 251-300 | 2 | 13.3 |
| 301-350 | - | - |
| 351-400 | 1 | 6.7 |
| 401-450 | 1 | 6.7 |
| 451-500 | - | - |
| 501-550 | 1 | 6.7 |
| >500 | 1 | 6.7 |
| Total | 15 | 100 |

Table 5: Visual impairment according to CD4 count.

unilateral) was found to be 2.2%. This is similar with 4.7% and 2.2% respectively recorded (extrapolation) by Otiti-Sengeri in Uganda [12].

However, the above contrasts with the findings of Shah et al. in India [14], where the prevalence of blindness and low vision was found to be 1.0% and 6.2% respectively. The patients involved in these studies were at various stages of treatment with highly active antiretroviral therapy (HAART). HAART is known to have a positive effect on immune recovery and ocular complications [15]. This observation coupled with the fact that their compliance to treatment is likely to vary, may explain the differences in prevalence recorded by various researchers.

Retrobulbar optic neuritis as a cause of blindness or visual loss in HIV/AIDS patients has been emphasized [16,17]. Retrobulbar optic neuritis was the commonest cause of blindness in our study population accounting for 33.4% of cases. This is similar with the findings in Uganda where optic neuropathy was the commonest cause of blindness and responsible for 30% of cases [12]. However, unlike the findings in Uganda, no case of optic atrophy or papilloedema was found in our series.

Cataract was the second commonest cause of blindness in this study and was responsible for 24.9% of blindness. Otiti-Sengeri [12] in Uganda found cataract to be responsible for 17.5% of blindness in their study. Unlike the situation in Africa where the use of HAART is still not widespread, cataract has been found to be a common cause of visual loss in North America in the HAART era [18]. Cataract is said to occur as a complication of intraocular inflammation due to immune recovery uveitis in patients with CMV retinitis [19]. It has also been found to occur as a consequence of inflammation in necrotizing retinitis as in progressive outer retina necrosis [20] and acute retinitis [21]. It can also occur in association with long term use of nucleoside analogue reverse transcriptase inhibitors [22]. One out of the cataracts in this study was caused by trauma. The cause of the other 2 cases of cataract was not known. The patients in this study have been on HAART ranging from a period of less than 1 month to five years. Consequently, the possibility of the cataracts resulting from the long term use of HAART cannot be ruled out completely. Further studies are suggested to resolve this, considering the age of the patients (43 and 53 years).

Maculopathy in recent times has been reported as a common cause of visual loss in patients with HIV/AIDS [6,7]. In our study, maculopathy was the third commonest cause of blindness and was responsible for 16.7% of cases. Maculopathy in HIV/AIDS patients may be due to the direct effect of HIV on the microvasculature of

the retina or as a consequence of associated infections in HIV [23]. These microvascular changes including alteration in blood flow leads to ischaemia of the macular and consequent visual loss as evidenced by fluorescein angiography [24,25]. Herpetic and cytomegalovirus infections has been found to be common causes of maculopathy in patients with HIV/AIDS infection [23,25]. The causes of maculopathy in this study are not known because of absence of good laboratory back up.

Cytomegalovirus retinitis is a rare cause of blindness in this population and was responsible for 8.3% of blindness. In Uganda [12], it was responsible for 17.8% of blindness. In the pre-HAART era, cytomegalovirus retinitis was the commonest cause of visual loss among HIV/AIDS patients [2,26]. However, with the widespread availability of HAART, visual loss and blindness due to CMV retinitis has substantially reduced [18]. The patients involved in this study were on HAART from a period ranging from less than one month to 5 years. The low incidence of blindness due to CMV retinitis in this study may be due to the effect of HAART.

Although rare, Herpes Zoster Ophthalmicus is a cause of visual loss in patients with HIV/AIDS [3,27,28]. In this study, it was responsible for 8.3% of blindness. This is similar to the findings in Uganda [12] (3.5%). Herpes Zoster virus is known to cause keratitis, uveitis, retinitis, optic neuritis and central retinal vein occlusion in HIV/AIDS infected patients leading to visual impairment [29-31]. Keratitis was the cause of visual impairment in our study. HIV/AIDS patients presenting with Herpes Zoster ophthalmicus must be thoroughly examined for early detection and treatment of these complications.

Ocular Toxoplasmosis was responsible for 8.3% of blindness among HIV infected patients in this study. It was responsible for 15.8% of blindness among HIV patients in Uganda [12]. Toxoplasmosis is an opportunistic infection in patients with HIV infection [32]. With widespread availability of HAART, its incidence and impact on vision is likely to diminish. The patients in our study were at different stages of treatment with HAART. The lower incidence of blindness due to toxoplasmosis compared with previous study may be due to the effect of HAART.

Limitation of Study

The number of patients with visual impairment in this study is low. To conclusively determine the causes of visual impairment in this population a larger population need to be examined in order to increase the yield of cases of visual impairment. However our finding gives an idea of the true situation.

Conclusion

Majority of HIV infected persons in this population have normal visual status (89.2%). However, for the minority with visual impairment (10.8%), retrobulbar optic neuropathy was the commonest cause of blindness (33.4%) followed by cataract (24.9%) and maculopathy (16.7%). As these complications may mar the beauty of a successfully implemented HAART programme due to their visual effect, early identification and treatment of these complications may improve the overall quality of life of these patients.

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