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 prescription 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.
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 as 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 fundus 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 (Males: Female ratio of 1:1.9). Their ages ranged from 9 to 66 years with a mean of 36.2 years (SD ± 10.0), (Table 1).

Of this number, 124 (89.2%) had normal vision, while 15 (10.8%) 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/µl, Table 5.

Patients with normal vision had an average CD4 count of 352.9 (SD ± 249.8) while those with visual impairment had an average CD4 count of 186.7 (SD ± 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 Otiti-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/µl or less. The average CD4 count in our study was 269.8 cells/µl while those for the studies by pathai et al. [13] and shah et al. [14] was 180 cells/µl and 200 cell/µl 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 unilateral low vision) was 8.3%.

### Table 1: Age and sex distribution of study population.

| Age(years) | Male (n) | Female (n) | Total (n) |
|------------|---------|------------|----------|
| 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 2: Visual Impairment in the 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 3: Causes of Blindness in the Study Population.

| Category / Causes of Blindness | Number | Percent |
|--------------------------------|--------|---------|
| (A) Bilateral blindness        |        |         |
| Retrobulbar optic neuropathy   | 2      | 16.7    |
| Cataract                       | 3      | 24.9    |
| (B) Unilateral blindness       |        |         |
| 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 4: Causes of low vision 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   |
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Table 5: Visual impairment according to CD4 count.

| 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  |

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.

Limitation of Study

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.

References

1. Centers for Disease Control (CDC) (1981) Pneumocystis pneumonia—Los Angeles. MMWR Morb Mortal Wkly Rep 30: 250-252.
2. Holbrook JT, Jabs DA, Weinberg DV, Lewis RA, Davis MD, et al. (2003) Visual loss in patients with cytomegalovirus retinitis and acquired immunodeficiency
syndrome before widespread availability of highly active antiretroviral therapy. Arch Ophthalmol 121: 99-107.
3. Kestelyn PG, Cunningham ET Jr (2001) HIV/AIDS and blindness. Bull World Health Organ 79: 205-213.
4. Cunningham ET Jr, Lietman TM, Whitcher JP (2001) Blindness: a global priority for the twenty-first century. Bull World Health Organ 79: 180.
5. Vitale AT (2005) Global HIV/AIDS and visual impairment. Cataract and Refractive Surgery Today.
6. Akduman L, Feiner MA, Olk RJ, Kaplan HJ (1997) Macular ischemia as a cause of decreased vision in a patient with acquired immunodeficiency syndrome. Am J Ophthalmol 124: 699-702.
7. Romano MR, Valldeperas X, Romano F (2006) Bilateral ischemic maculopathy in a patient with AIDS. Eur J Ophthalmol 16: 761-763.
8. Vrabec TR (2004) Posterior segment manifestations of HIV/AIDS. Surv Ophthalmol 49: 131-157.
9. Raina J, Bainbridge JW, Shah SM (2000) Decreased visual acuity in patients with cytomegalovirus retinitis and AIDS. Eye (Lond) 14: 8-12.
10. Thorne JE, Holbrook JT, Jabs DA, Kempen JH, Nichols C, et al. (2007) Effect of cytomegalovirus retinitis on the risk of visual acuity loss among patients with AIDS. Ophthalmology 114: 591-598.
11. Goyal JL, De Samii, Singh NP, Bhatia A (2003) Evaluation of visual functions in patients on ethambutol therapy for tuberculosis: a prospective study. J Commun Dis 35: 230-243.
12. Otshi-Sengier J, Colebunders R, Kempen JH, Ronald A, Sande M, et al. (2010) The prevalence and causes of visual loss among HIV-infected individuals in Uganda. J Acquir Immune Defic Syndr 53: 95-101.
13. Pathai S, Deshpande A, Gilbert C, Lawn SD (2009) Prevalence of HIV-associated ophthalmic disease among patients enrolling for antiretroviral treatment in India: a cross-sectional study. BMC Infect Dis 9: 158.
14. Shah SU, Kerkar SP, Pazare AR (2009) Evaluation of ocular manifestations and blindness in HIV/AIDS patients on HAART in a tertiary care hospital in western India. Br J Ophthalmol 93: 88-90.
15. Aturam B, Carcelain L, Li TS, Blanc C, Mathez D, et al. (1997) Positive effects of combined antiretroviral therapy on CD4+ T cell homeostasis and function in advanced HIV disease. Science 277: 112-116.
16. AlimanoivÄ-HalliovÄ E, IbisevÄ M (2007) Retrolubar optic neuritis as first sign of HIV infection. Med Sci Monit 13: 128-130.
17. Liu JZ, Brown P, Tsels A (2005) Unilateral retrolubar optic neuritis due to varicella zoster virus in a patient with AIDS: a case report and review of the literature. J Neurol Sci 237: 97-101.
18. Thorne JE, Jabs DA, Kempen JH, Holbrook JT, Nichols C, et al. (2006) Causes of visual acuity loss among patients with AIDS and cytomegalovirus retinitis in the era of highly active antiretroviral therapy. Ophthalmology 113: 1441 – 1445.
19. Kempen JH, Sugar EA, Lyon AT, Lewis RA, Jabs DA, et al. (2012) Risk of cataract in persons with cytomegalovirus retinitis and the acquired immune deficiency syndrome. Ophthalmology 119: 2343-2350.
20. Engstrom RE Jr, Holland GN, Margolis TP, Muccioli C, Lindley JI, et al. (1994) The progressive outer retinal necrosis syndrome. A variant of necrotizing herpetic retinopathy in patients with AIDS. Ophthalmology 101: 1488-1502.
21. Blumenkranz MS, Cubertson WW, Clarkson JG, Dix R (1986) Treatment of the acute retinal necrosis syndrome with intravenous acyclovir. Ophthalmology 93: 296-300.
22. Gaynes B (2005) “Star” suture opacities of the crystalline lens: an illustrative report in AIDS patients. Med Sci Monit 11: P9-13.
23. Rocha lima B (2004) Ophthalmic manifestations of HIV infection. Digital Ophthalmology 10.
24. Cunningham ET Jr, Levinson RD, Jampol LM, Engstrom RE Jr, Lewis H, et al. (2001) Ischemic maculopathy in patients with acquired immunodeficiency syndrome. Am J Ophthalmol 132: 727-733.
25. Correa ZM, Bellini LP, Falci D, Freitas AM, Marcon LM (2003) Ischaemic maculopathy in patients with acquired immunodeficiency syndrome and CD4 T-lymphocyte count under 50 cells/µl. Invest Ophthalmol Vis Sci 44: 4614
26. Stewart MW (2011) Impact of HIV on vision. Northeast Florida Medicine 62: 3-8.
27. Umeh RE (1998) Herpes zoster ophthalmicus and HIV infection in Nigeria. Int J STD AIDS 9: 476-479.
28. Adio AO, Fiebai B (2010) Herpes zoster ophthalmicus and HIV seropositivity in South-south Nigeria. Niger J Med 19: 162-164.
29. Looney BD (1997) Herpes Zoster Ophthalmicus. Clinical Eye and vision care 9: 203-211.
30. Greven CM, Singh T, Stanton CA, Martin TJ (2001) Optic chiasm, optic nerve, and retinal involvement secondary to varicella-zoster virus. Arch Ophthalmol 119: 608-610.
31. Biswas J, Deka S, Padmaja S, Madhavan HN, Kumaramany N, et al. (2001) Central retinal vein occlusion due to herpes zoster as the initial presenting sign in a patient with acquired immunodeficiency syndrome (AIDS). Ocul Immunol Inflamm 9: 125-130.
32. Meisheri VV, Mehta S, Patel U (1997) A prospective study of seroprevalence of Toxoplasmosis in general population, and in HIV/AIDS patients in Bombay, India. J Postgrad Med 43: 93-97.