

Neuro-Ophthalmic Complications Secondary to Infectious Meningitis in HIV Immunosuppressed: A 3 Cases Series in Yaoundé Central Hospital

Mvilongo C^{1*}, Epée E¹, Owono D¹, Dohvoma V¹, Akono E¹, Nguena B¹, Ebana S², Nomo A³, Bella A⁴ and Ebana Mvogo C¹

¹Department of Ophthalmology, Central Hospital of Yaounde, Cameroon

²Department of Ophthalmology, Gynaeco-Obstetric and Pediatric Hospital of Douala, Cameroon

³Faculty of Medicine and Biomedical Sciences of the University of Yaounde I, Cameroon

⁴Department of Ophthalmology, Gynaeco-Obstetric and Pediatric Hospital of Yaounde, Cameroon

*Corresponding Author: Mvilongo C, Department of Ophthalmology, Central Hospital of Yaounde, Cameroon.

Received: January 28, 2017; Published: February 27, 2017

Abstract

Objectives: Determine the mechanisms of onset of neuro-ophthalmic manifestations in the context of infectious meningitis in HIV immunosuppressed patient.

Introduction: The Human immunodeficiency virus (HIV) remains a public health problem in developing countries. In late 2007, the number of peoples living with HIV in the entire world was estimated at 33.2 million. According to UNICEF, the prevalence of HIV in Cameroon in 2012 is 4.5%. The neuro- ophthalmic complications are present in about 10 - 15 % of patients infected by HIV.

Case description: We are reporting 3 cases of immunosuppressed patients who presented with optic disc edema and oculomotor nerve palsy as neuro-ophthalmic involvement in the context of infectious meningitis.

Clinical cases:

Case 1: Mr M, 36 years old HIV immunosuppressed on Anti-retroviral drugs (ARVs) and type 2 diabetic mellitus patient on insulin, with a past medical history of neuromeningeal cryptococcosis; presented in ocular examination a huge papilledema revealing an optic neuritis.

Case 2: Mr E M., 37 years old with past medical history of Pott's disease and tuberculous meningitis since 2 years, HIV immunosuppressed on ARVs admitted for right third oculomotor nerve palsy.

Case 3: Mrs M A., 31 years old managed for cryptococcal meningitis, hiv immunosuppressed on ARVs admitted for bilateral sixth nerve palsy.

Discussion: Oculomotor nerves palsies and optic neuropathies occur in infectious meningitis (Cryptococcosis, HIV encephalitis, VZV, CMV, toxoplasmosis and lymphoma). Central nervous system involvement in HIV patients are frequent and secondary to various causes: the immunosuppression (Opportunistic infections, lymphomas and other tumors); the HIV virus itself and the side effects of antiretroviral drugs therapy.

Conclusion: Infectious meningitis in HIV immunosuppressed is correlated to the CD4 rate and is related to the predilection of some pathogens agents to affect the brain and the meninges.

Keywords: Meningitis; Neuritis; Oculomotor Nerve Palsy; HIV

Introduction

The Human immunodeficiency virus (HIV) remains a public health problem in developing countries. In late 2007, the number of

peoples living with HIV in the entire world was estimated at 33.2 million [1]. According to UNICEF the prevalence of HIV in Cameroon in 2012 is 4.5% [2].

Histological studies have shown that 75 - 90% of HIV patients contact cerebral damages, including the optic nerve [3]. Neuro-ophthalmic involvement have been widely described in HIV asymptomatic patients and in those with AIDS [4].

Neuro-ophthalmic complications are seen in about 10 - 15% of patients who are infected by HIV. The common causes of neuro-ophthalmic complications include: meningeal cryptococcosis, parenchyma and meningeal lymphoma, neurosyphilis, and toxoplasmosis [5].

We are reporting 3 cases of HIV immunosuppressed patients who presented with optic disc edema and oculomotor nerve palsy as neuro- ophthalmic complications in the context of infectious meningitis.

Clinical case 1

Mr D L., 36 years old consulting for decreased visual acuity in both eyes since 2 weeks.

The Past medical history reveals: the patient is known with type 2 Diabetes mellitus on Metformine and mixtard, known immunosuppressed on ARVs and treated for neuromeningeal cryptococcosis since 3 months. The patient presented generalized head ache associated with a meningeal syndrome that was confirmed by Cryptococcus Neoformans examination with the encre of chine; and a high blood sugar at 3.7 g/l (he was on ARVs drugs therapy: TDF/3TC/EFV 600: 1tab/day with a CD4 rate of 15 cells).

On ocular examination, he had:

- A visual acuity of 3/10 in the right eye and 1/10 in the left eye not improving with pin hole.
- The anterior segment revealed bilateral semi- dilated reactive pupils.
- Bilateral phakosclerosis
- In the Fundus: a bilateral papilledema
- He had an alterated general state
- The initial management consisted on administration of neuroprotector drugs associated

Clinical case 2

Mrs E M., 37 years old, known HIV immunosuppressed on antiretroviral drugs followed up for pott's disease and tuberculous meningitis since 2 years; consulting for bilateral decreased visual acuity since one year.

The past medical history reveals an immunosuppression by HIV discovered 4 years ago on antiretroviral drugs: ABACAVIR/3TC/ATAZANAVIR since 2 years with an undetectable viral load in August 2016. The first CD4 rate was at 72/mm³.

She is followed up for bone and meningeal tuberculosis since 2 years with the use of anti-tuberculous drugs for one year (2015). The last CD4 was at 403 cells/mm³. The head CT scan done in 2014 reveals an encephalitis with communicating hydrocephalus. With The differential diagnosis on imagery of left posterior cerebral ischemia

On ocular examination we had:

- A reduced visual acuity in right eye of counting finger at 3m and 1/10 in left eye; not improving with pin hole.
- An intra-ocular pressure in right eye of 13.3 mmhg and 11.0 mmhg in left eye.
- The anterior segment examination:
- An anisocoria with in right eye the presence of direct light pupillary reflex but reduced consensual light reflex
- In left eye: pupil semi dilated are flexive with afferent pupillary defect
- The extra ocular movement examination found: a limited upgaze right and left eye, a limited down gaze right-left eye, a limited adduction of right eye.

In posterior segment examination, the fundus reveals an optic disc with a cup/disc ratio of 0.3 with temporal pallor and normal rim.

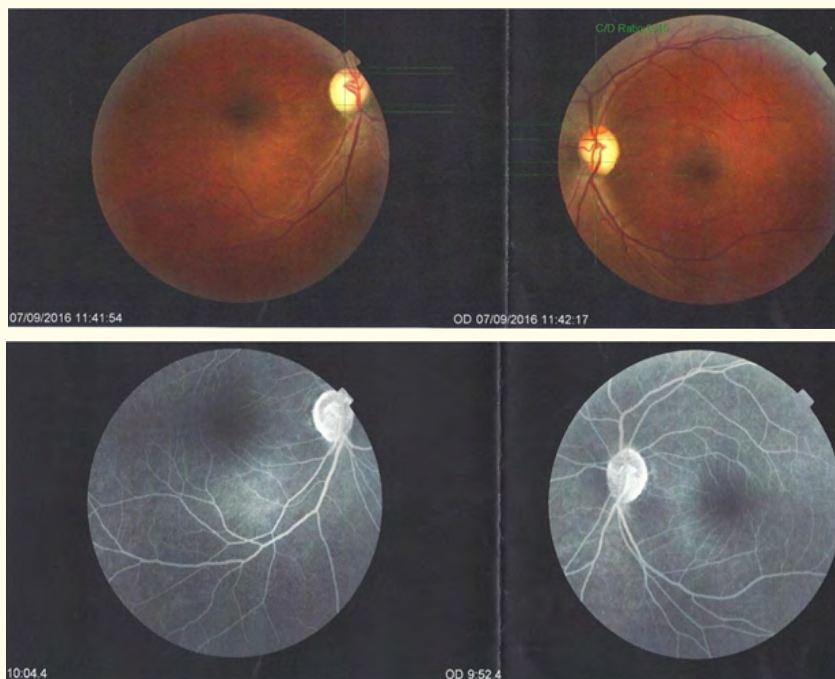


Figure 1: Fluorescein Angiography showing a mild optic disc pallor.

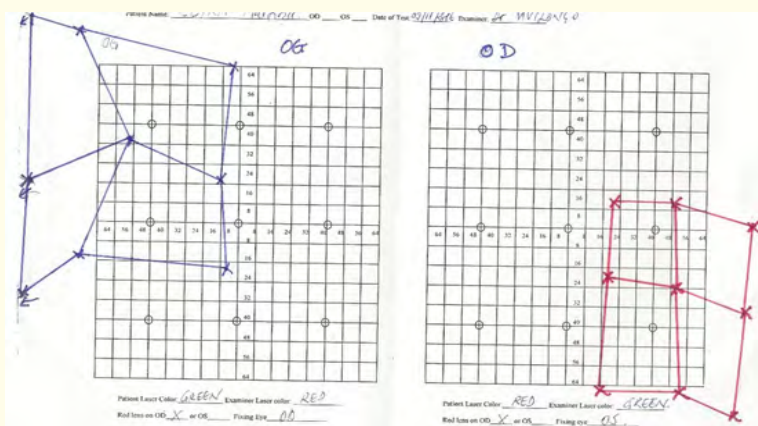


Figure 2: Incomplete bilateral IIIrd nerve palsy and IV nerve.

Clinical case 3

Mrs M A., 31 years old consulting for bilateral deviated eyes since 1 month with left eye pain and diplopia.

In the past medical history, the patient has cryptococcal meningitis and is known HIV immunosuppressed on antiretroviral drugs: anzavir-R: 1 tab/day and Abacavir/Lamivudine: 1 tab/day (notion of failure to the first treatment).

She is been managed for cryptococcal meningitis with 3 episodes of recurrence on Flucytosine 12 tab/day.

The ocular examination found a visual acuity in right eye of 2/10 and 3/10 in left eye. The Best corrected visual acuity in right eye was 7/10 (refraction right eye: + 0.5(- 0.5) 10°; left eye: +0.25 (-0.50) 100°).

The oculomotor nerve examination showed a limited abduction and a crossed horizontal diplopia.

On anterior segment: in right eye, the pupil is semi dilated, reactive with a relative afferent pupillary defect, and in the left eye: the pupil has good direct and consensual light reflex. The rest of anterior segment examination is normal.

On fundus examination: both eyes had blurred optic disc rim indicating a resolving papilledema. The general state was altered by the cachexia and asthenia.

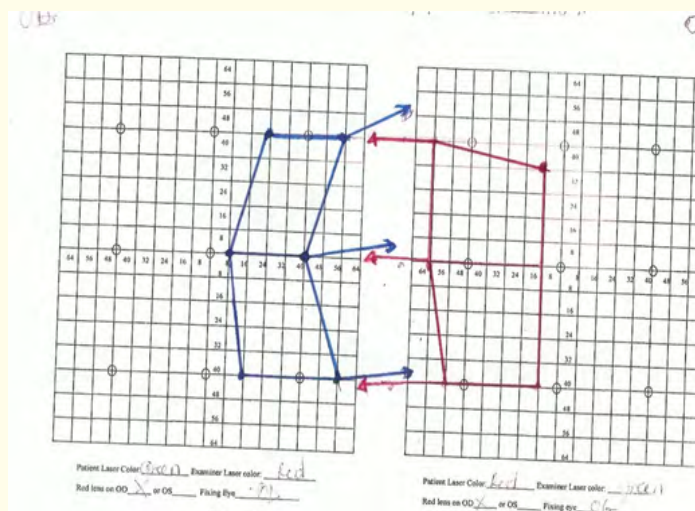


Figure 3: Bilateral VI nerve palsy.

Her management consisted in suppressing the diplopia by alternated eye occlusion and in treating the cause.

Discussion

These 3 patients present similarly a decreased visual acuity not improving following an infectious meningitis in the background of HIV immunosuppression associated with or without oculomotor nerves anomalies. The differential diagnosis is made between a peri-optic neuritis and an optic neuropathy.

Central Nervous System involvement by the Human Immune Deficiency virus are frequent and secondary to: the immunosuppression by opportunistic infections, lymphomas and other tumors; the HIV virus itself or secondary to the side effects of antiretroviral drugs therapy [6].

Optic neuropathies in HIV patients are caused by various pathologies including infectious process, inflammatory and compressive. There is evidence that the optic nerves of HIV patients could have a chronic degenerescence resulting in the loss of axons. The more accepted theory is that played by the alpha tumoral necrosis factor in the primary genesis of optic neuropathies. The pathogenesis of neuronal manifestations is described like the combinaison of the effect of neurotoxic agents including viral proteins and the neurotoxic factors produced by activated microglia and macrophages [7].

Oculomotor nerves palsies in HIV immunosuppressed patients could be due to microangiopathies responsible of the involvement of the central nuclei of the different nerves. Ebana, *et al.* in a serie reported in 2005: 3 cases of bilateral blindness and one loss of vision

from central cause due to cerebral toxoplasmosis and one case of cryptococcal neoformans meningitis with 2 cases of oculomotor nerves palsies [8].

Oculomotor nerves palsies and optic neuropathies occur in cases of meningitis (cryptococcosis, HIV encephalitis, VZV, CMV, toxoplasmosis and lymphoma). The *Neoformans Cryptococcus* has a predilection for the Central Nervous System. Various visual disturbances going up to blindness can be due to direct fungal involvement of optic pathways, arachnoiditis, chorioretinitis or an increased intracranial pressure with the presence of papilledema associated to meningo-encephalitis [9].

Neoformans Cryptococcal meningitis is the most frequent cause of neuro-ophthalmic involvement. In fact, twenty five percent of patients presenting a cryptococcal meningitis develop neuro-ophthalmic manifestations [10]. In our serie, 2 of the 3 patients had Neoformans cryptococcal meningitis. The clinical polymorphism of the tuberculous meningitis is well known since. The basilar signs are one of the precious orientation elements to the tuberculous cause. Among these basilar signs, we have oculomotor nerves palsies and particularly the third cranial nerve involvement which has more value than that of the sixth cranial nerve frequently paralyzed once there is a cerebral distress [11]. Our second patient presented a bilateral IIIrd nerve palsy in the context of tuberculous meningitis. Many cranial nerves can be involved simultaneously and the cause is the arachnoiditis affecting the base of the brain and this equally can be responsible of the important reduction of the visual acuity with papilledema in fundus.

The treatment is symptomatic and is directed to the microorganism in cause and the immunitary restitution of patient. The aim of the treatment of the oculomotor nerve palsy is to suppress the diplopia and to fight against hyperaction and secondary inhibition; and this is based on the occlusion of the paralyzed eye or alternated in case of bilateral involvement.

Conclusion

Neuro-ophthalmic manifestations of HIV are correlated to the CD4 rate and to the predilection. Of some pathogens agents for the brain and the meninges. Their prognostic depends on the precocity of the diagnosis and on the prompt management of patients. Therefore, systematic ocular examination should be part of the follow up assessment of HIV patients.

Bibliography

1. "2007 UNAIDS Annual Report: Knowing your epidemic". *Un aids* (2008): 1-51.
2. Statistics, Cameroun, UNICEF.
3. Gray F, *et al.* "Neuropathology and neurodegeneration in human immunodeficiency virus infection. Pathogenesis of HIV-induced lesions of the brain, correlations with HIV-associated disorders and modifications according to treatments". *Clinical Neuropathology* 20.4 (2001): 146-155.
4. Mwanza J-C., *et al.* "Neuro-ophthalmological disorders in HIV infected subjects with neurological manifestations". *British Journal of Ophthalmology* 88.11 (2004): 1455-1459.
5. Lagac DJ., *et al.* "Le VIH et ses manifestations oculaires: 30 ans après (Partie 1)". (2015): 11-20.
6. Moulignier A. "Central nervous system and HIV-1 infection" (2008).
7. Wright P. "Atlas of Ophthalmology". *The British Journal of Ophthalmology* (1983): 712.
8. C EM., *et al.* "Eye Complications of Hiv-Aids Infection in the Cameroonic Environment: Is there a Correlation with the Cd4 Rate?" (2007): 7-12.

9. Muccioli C., *et al.* "Limbal and choroidal Cryptococcus infection in the acquired immunodeficiency syndrome". *American Journal of Ophthalmology* 120.4 (1995): 539-540.
10. Jabs DA. "Ocular manifestations of HIV infection". *Transactions of the American Ophthalmological Society* 93 (1995): 623-683.
11. Ouhabi H., *et al.* "Manifestations Pseudo-Myastheniques". *Médecine du Maghreb* 51 (1995): 2-5.

Volume 5 Issue 3 February 2017

© All rights reserved by Mvilongo C., *et al.*