

Onchocerciasis and Ocular Manifestations in the City of Inga in the Democratic Republic of Congo

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ABSTRACT

Onchocerciasis is the second leading cause of infectious blindness in the world after trachoma. A parasitic disease caused by a nematode specific to humans, *Onchocerca volvulus*, it is transmitted by the female black fly in places close to fast-flowing streams. This affection is serious by its ocular complications which earned him the name of river blindness. The World Health Organization estimates that 120 million people are exposed to onchocerciasis and about 18 million people are infected, of whom more than 99% live in intertropical Africa. Among them, 350 thousand are blind. The aim of our study is to determine the types of ophthalmological lesions in patients with onchocerciasis in the city of Inga in the Democratic Republic of Congo. Our series includes 100 patients, having benefited from a complete clinical examination and an ex-blood biopsy to confirm the onchocerciasis diagnosis. The prevalence in our study is 58%. The average age of our patients was 39.12 ± 15.71 years. We noted a male predominance with a sex ratio of 2.62. People working in fishing are the most affected by onchocerciasis, ie 44.85%. 27 out of 58 patients, ie 46.55%, benefited from mass treatment with Ivermectin. The lifespan of patients in the city of Inga was 24.71 ± 9.5 years. Ocular manifestations were 67.2%. The city of Inga is a known endemic focus for onchocerciasis (Prevalence 58%), ophthalmological manifestations are frequent in the city of Inga (67.2%, 13.7% of blind people). The treatment of masses with ivermectin remains the only means of preventing the ophthalmological complications of onchocerciasis, hence the importance of good awareness-raising so that the population living in endemic regions participates in the treatment of masses.

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Introduction

Onchocerciasis and Ocular Manifestations

Onchocerciasis is the second leading cause of infectious blindness in the world after trachoma. A parasitic disease caused by a nematode specific to humans, *onchocerca volvulus*, it is transmitted by the female blackfly in places close to fast-flowing streams [1]. It is serious due to its ocular complications which have earned it the name of river blindness. The World Health Organization estimates that 120 million people are exposed to onchocerciasis, about 18 million people are infected, more than 99% of whom live in intertropical Africa, among them 350 thousand are blind [3]. The clinical picture of onchocerciasis is dominated by the cutaneous syndrome (the cystic syndrome, the lymphatic syndrome) and the ocular syndrome. The aim of our study is to determine the types of ophthalmological lesions in patients with onchocerciasis in the city of Inga in the Democratic Republic of Congo.

Material and Method

This work was carried out in the city of Inga in the Democratic Republic of Congo. This is a prospective descriptive study which spans a period of 1 month, from February 3 to March 3, 2015. All our patients underwent a complete ophthalmological examination including visual

acuity, examination of the anterior segment of the eye and the fundus of the eye. Ex-blood biopsy was performed in all patients.

Results Analysis

SPSS and Excel software were used for data entry and processing. The following statistical calculations were used: the calculation of the percentage, the mean, the standard deviation and the sex ratio, the chi-square, to compare the means and the significance level set at any value of $p < 0.05$.

Results

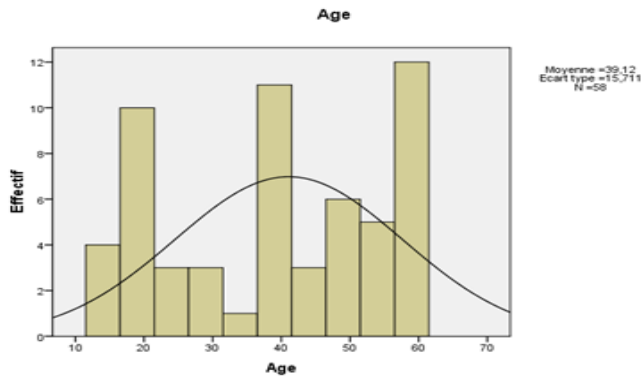
Our series includes 58 patients, having benefited from a complete ophthalmological examination and an ex-blood biopsy to confirm the onchocerciasis diagnosis.

1. Age

The average age of our patients was 39.12 ± 15.71 .

2. Sex

We noted a male predominance with a sex ratio of 2.62.



3. Occupation

Patients in the following occupations are most at risk for onchocerciasis :

- Peach: 26 out of 58 patients, or 44.85% ;
- Agriculture: 12 of 58 patients, or 20.75% ;
- Student: 12 out of 58 patients, or 20.75% ;
- All works: 5 out of 58 patients, or 8.62% ;
- Unemployed: 3 out of 58 patients, or 5.17%.

4. Treatment

27 out of 58 patients, or 46.55% benefited from mass treatment with Ivermectin.

5. Ocular Manifestations

39 out of 58 onchocerciasis patients had ocular manifestations, i.e. 67.2%. The ocular manifestations found were as follows: Cataract 51.2%, Superficial punctate keratitis 25.6%, Conjunctivitis 30.7%, Sclerosing keratitis 5.12%, Uveitis 5.12%, Chorioretinitis 7.69%, Optic atrophy 2.56% .

Ocular pathology	Number of cases	Patient Total	Percentage
Cataract	20	39	51, 12%
Superficial punctate keratitis	10	39	25,6%
Conjunctivitis	12	39	30,7%
Sclerosing keratitis	2	39	5,12%
Uveitis	2	39	5,12%
Chorioretinitis	3	39	7,69%
Optic atrophy	1	39	2, 56%

- The attack was bilateral in 37 out of 39 patients, or 94.87%.

6. Visual acuity

We divided patients' visual acuity into 3 categories :

- 5/10 to 10/10: 30 out of 58 patients, or 51.42% ;
- 1/10 to 4/10: 5 of 58 patients, or 8.62%.

Less than 1/10: 23 out of 58 patients, or 39.65% including 13.7% blind.

Discussion

Jean Hissette, a native of Florenville, was the first to discover, in 1932, in the heart of Central Africa, the cause of the blindness that struck the inhabitants of the region of Sankuru in the former Belgian Congo [6]. In 1935, Bryant found a similar lesion in Sudan.

The microfilariae of *O. volvulus* can invade all ocular membranes or structures but the importance of the lesions produced varies according to the organs which are affected.

At the level of the cornea, there are two main types of lesions.

Punctate keratitis which is an early and resolving manifestation and later and much more serious sclerosing keratitis which progresses to complete corneal opacification.

The presence of microfilariae in the uvea is the cause of iridocyclitis. It is a serious complication because it can lead to secondary glaucoma and also, but more rarely, to ocular consumption.

Cataract does not seem to be a typical onchocerciasis lesion. Hissette (1932) and Vellieux et al. (1958) describe the greenish appearance of the lens while Puyuelo and Holstein (1950) mention opacities. Microfilariae can be seen attached to the anterior crystalloid (Van Den Dorpe, 1958), but Choyce (1958) thinks they are unable to penetrate the lens. However, Neumann and Gunders (1963) found microfilariae inside the cataracts they extracted and the latter author (1973) suggests their cataractogenic effect. Organized plaques of exudate in the pupil on the anterior surface of the lens are sometimes interpreted as complicated cataracts (Choyce, 1963). But this does not exclude the possibility of encountering cataract secondary to luveitis (Maertens) [3].

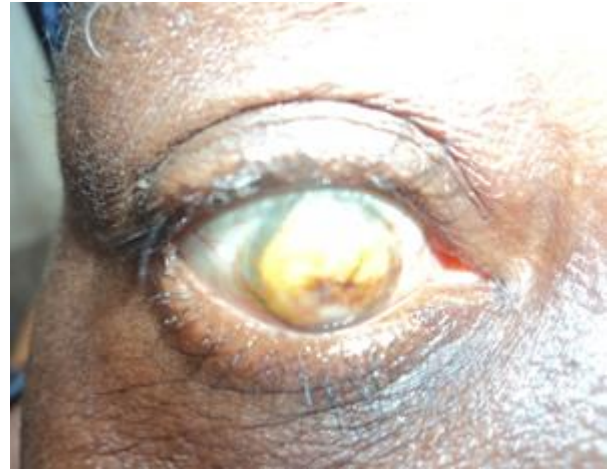


Figure 1. sclerosing keratitis in a patient in the city of Inga.

A study carried out in Togo by BANLA M in 2011, in an onchocercal endemic environment, 298 subjects (41.7%) were carriers of senile cataract, against 67 subjects (31.8%) in a healthy environment; ($p = 0.0328$), the difference was significant between the two media. Onchocerciasis would be an etiological factor of senile cataract [5].

In our series, apart from sclerosing keratitis and chorioretinitis described in the literature as responsible for blindness of onchocercal origin, we found that cataracts are the main cause of visual impairment in onchocerciasis, 51.2% of patients are affected including 13, 7% are blind.

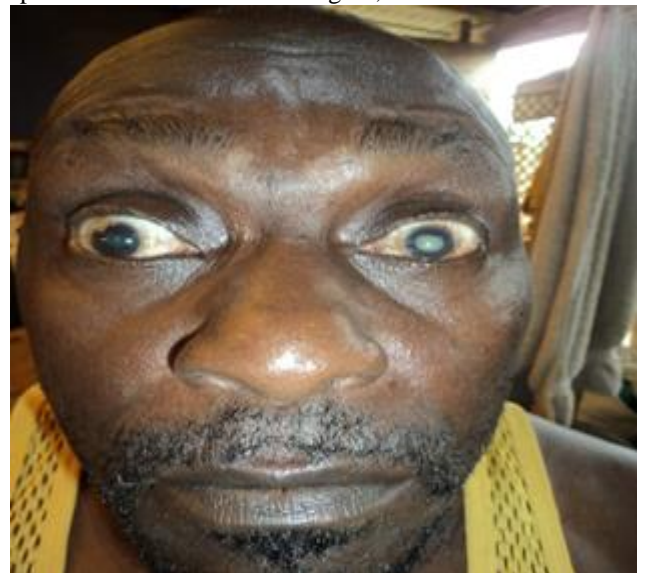


Figure 2. Left eye cataract in a Patient at the city of Inga
Chorioretinitis is another serious complication that also leads to blindness. Chorioretinal lesions can be classified into

three groups: irregular pigmentations, pigment migration and visibility, and sclerosis.

Dappled chorioretinitis results in the presence of pigment deposits scattered in clumps, alternating with irregular whitish patches. Early pigment epithelial atrophy. Localized in the temporal region, it can be detected by angiography.

The tigroid chorioretinitis testifies to an attack of the pigmentary epithelium very advanced. The lesions are irregular and reveal the grainy appearance of the choroid with more or less atrophied vessels.

Hissette-Ridly chorioretinitis Characterizes the advanced form of onchocercal damage to the retina. Its appearance of dried mud with a network of reddish-brown plaques traversed by fine irregular furrows and a damask of pigments contrasts with the pallor of the choroidal vessels and the presence of large clear plaques. This marked retinal atrophy predominates in the temporal and peripapillary areas [4].

One of our observations corresponded to onchocercal chorioretinitis in its anatomical form of Hissette-Reddly, we retained this diagnosis of chorioretinitis of Hissette-Reddly, given the clinical and angiographic appearance of the lesions: the disappearance of the pigmentary epithelium at the posterior pole of the left eye and the presence of this deep extensive cicatricial lesion at the posterior pole.

Involvement of the optic nerve gives the appearance of a papillitis which can be uni or bilateral with a regression of the protomotor reflexes and a papillary edema. Untreated it progresses to optic atrophy

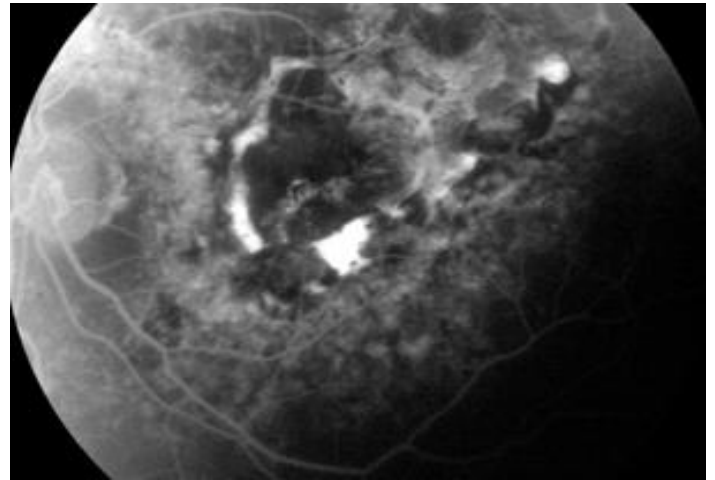


Figure 3. onchocercal chorioretinitis in a patient in the dinga city

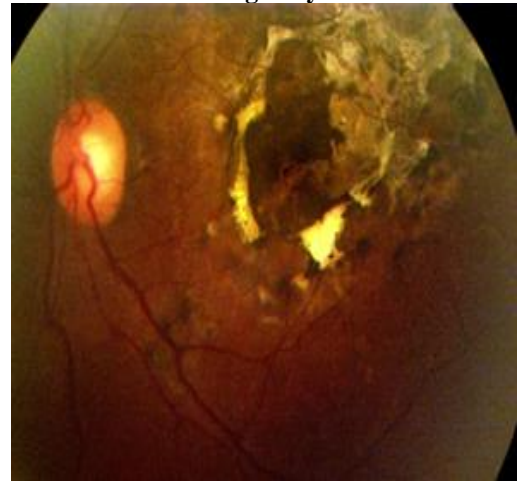


Figure 4. macular hypofluorescent lesion on fluorescein angiography in a patient with onchocercal chorioretinitis in the city of Inga

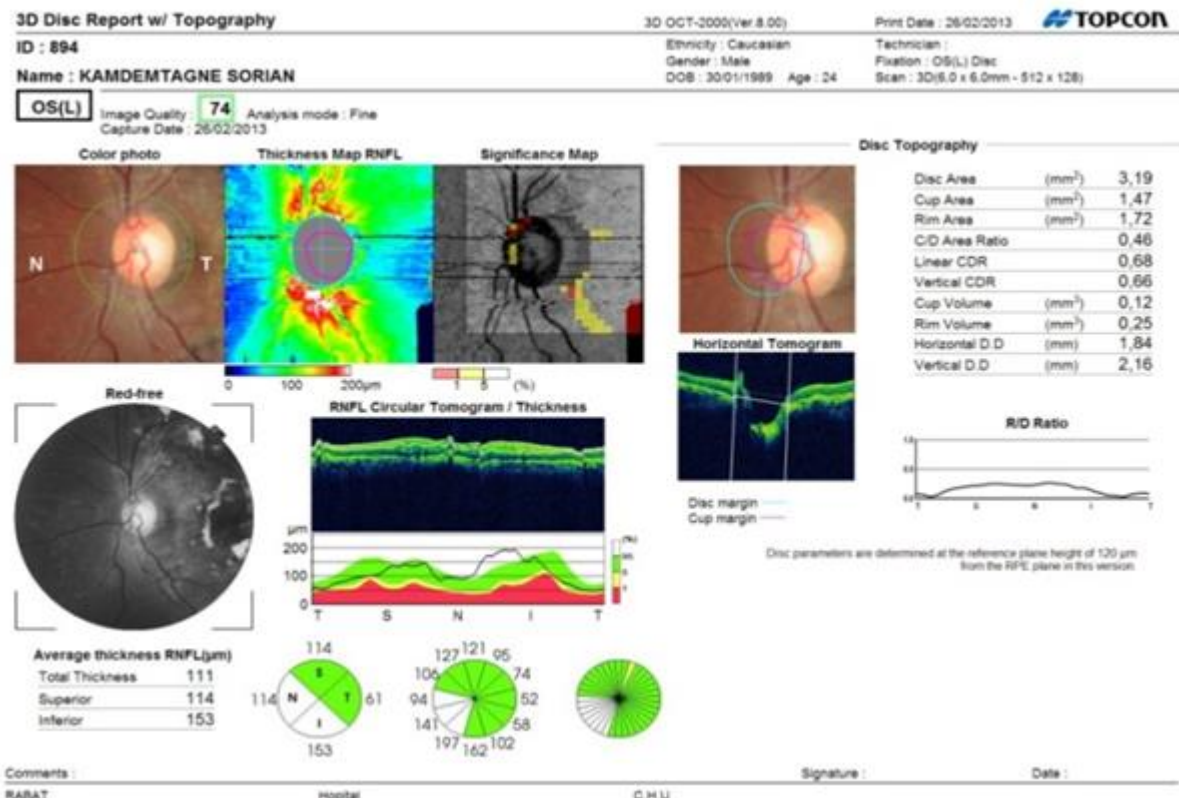


Figure5. OCT of onchocercal chorioretinitis in a patient in the city of Inga

The high prevalence of ocular manifestations in the city of Inga se (67.2%), is justified by the location of the city of Inga in the savannah vegetation. Several authors suggest that in Africa the ocular manifestations of onchocerciasis are more frequent in savanna regions than in forest regions.

Conclusion

The city of Inga is a known endemic focus for onchocerciasis (Prevalence 58%), ophthalmological manifestations are frequent in the city of Inga (67.2%, 13.7% of blind people).

This parasitosis must be fought with effective means because it promotes the impoverishment of the population through its side effects on sight (blindness).

If the diagnosis of onchocerciasis is easy by the discovery of the parasite (*O. volvulus*), it is not the same for the treatment of serious irreversible ocular lesions and the fight against the vector.

The treatment of masses with ivermectin remains the only means of preventing the ophthalmological complications of onchocerciasis, hence the importance of good awareness-raising so that the population living in endemic regions participates in the treatment of masses.

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