

Case Report

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Case Report on Onchocerciasis

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ABSTRACT

Onchocerciasis is a disease caused by a microfilaria worm known as *onchocerca volvulus* usually transmitted to humans through the bite of an infected blackfly. It affects the skin and eye and the larva of the organism develops into adult filaria resulting in large spectrum of manifestations which increases the risk of blindness. This case report presents the case of a 28 years old female patient with onchocerciasis, referral and follow up. The study also discussed the clinical features, findings and treatment options.

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Introduction

Onchocerciasis is one of the neglected tropical disease (NTD) commonly encountered in rural areas of Africa. The disease is transmitted through repeated bites of blackfly during blood meal and also called river blindness because the blackfly responsible for the transmission breeds near fast flowing streams and rivers in rural areas. The disease affects the skin and eyes of an infected person and often manifests as bumps on the skin, rashes, change of skin colour, skin scarring and swelling. Some complains of itching, redness and more severe complications such as sclerosing keratitis and corneal opacity finally leading to blindness have been reported [1]. The World Health Organization (WHO) estimates that 25 million people are infected with *onchocerca volvulus* worldwide, amongst these people 300,000 are blind and 800,000 have some sort of visual impairment. The vector of this disease which is blackflies are found in rural agricultural areas in sub-saharan Africa [1]. The global burden of Onchocerciasis estimated there were at least 20.9 million people infected worldwide, of which 14.6 million have skin disease and 1.15 million people had vision loss annually resulting to blindness elicited by microfilariae which migrate to the eyes after release by female adult worms in the subcutaneous tissues [1]. There are varying cases of blindness due to onchocerciasis including those from parasitic agents which are of great public health concern.

Case Report

Initial Visit

A 28 years old female Cook, from Eastern Nigeria who recently relocated to Ikoyi waterside, Lagos state visited the Nigerian Army Eye Centre Lagos on the 21st of February 2020. The presenting complains were itching, gritty and foreign body sensation in the right eye. There was no family history of ocular or medical condition. On examination with Snellen acuity, the unaided distant

visual acuity in the right eye was 6/12 and left eye was 6/9 and near visual acuity was N5 at 40cm. Pinhole visual acuity improved to 6/6 in both eyes and preliminary external examination using penlight showed smooth ocular motility, a clear conjunctiva, clear cornea and a normal pupillary reflex. Contact tonometry using perkins applanation tonometer revealed 16mmHg and 15mmHg in the right and left eye respectively. The blood pressure was 100/80mmHg and pulse rate of 60b/min. Random blood sugar was 88mg/dL. A funduscopy examination revealed a cup to disc ratio of 0.2 and normal blood vessels and macula in both eyes. The anterior segment examination under slit lamp biomicroscope confirmed the anterior segment of the eye to be normal but revealed the presence of a live adult nematode worm estimated to be about 450 mm in length with a diameter of 0.5 mm visible in the lateral subconjunctival space of the right eye while posterior segment examination was essentially normal. Attempts to remove the worm with toothless forceps was not successful particularly because the patient was apprehensive. Following assessment, she was prescribed Bethamesone + Neomycin () eyedrop 1drop 3x daily for use on the right eye and follow up was scheduled the next day.

Follow up Visit 1

On return to clinic next day being 22nd February 2020, the patient was less apprehensive after counselling. Surgical procedure under local topical anesthesia was conducted and the worm was successfully removed. Chloramphenicol ointment was inserted on the right eye and padded to be reviewed in 4 days.

Differential Diagnosis

Ocular onchocerciasis results from severe inflammatory reactions due to multiplication and toxic effects of dead filarial worm after transmission causing conjunctivitis, uveitis, chorioretinitis, optic atrophy, glaucoma, keratitis, cornea neovascularization and scarring of cornea which can lead to corneal opacity, cataract and eventually blindness. Other helminthic infestations are relevant in differential diagnosis of onchocerciasis [2].

Gnathstomiasis can occur in the eye involving surrounding tissues caused by a motile microfilaria larva resulting in edema and haemorrhage of eyelid as well as inflammation of the orbit which was not evident in this case and therefore was not considered as a possibility [3].

Lymphatic filariasis also manifests in such condition usually of modest size, very often motile and noticeable due to interference with vision. Although the worm was motile in this case but was prominently large in size and no lymphadema was seen in the eye. *Coenurus cerebralis* also occur especially after accidental direct inoculation with infected microfilaria egg which results in red and painful eye leading to glaucoma but in this case the patient's eyes was neither painful nor reddish and the intraocular pressure was normal.

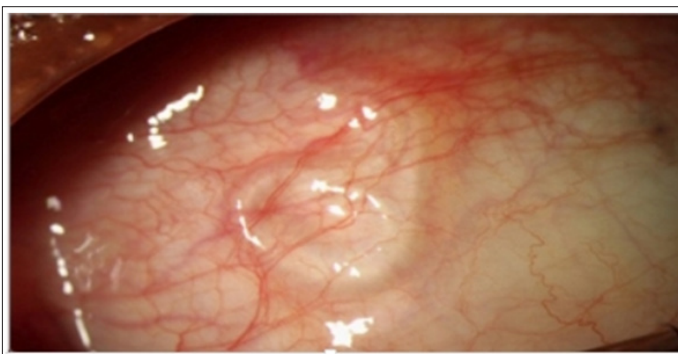


Figure 1: Image showing the microfilarial worm before surgical excision

Myiasis can result with cutaneous boils and swelling within the eye and surrounding structures but was absent in this patient's case. The absence of sclerosing keratitis and entropion excluded trachoma as well the absence of asymptomatic eosinophilia excluded the diagnosis of strongyloidiasis. The presence of motile, long adult worm narrowed the diagnosis to loa loa filariasis and onchocerciasis. A tentative diagnosis of loa-loa filariasis was made and the patient was to continue the use of eyedrop prescribed and a return to clinic in 4 days. The specimen (worm) was preserved in a saline solution and sent to pathology Department Lagos University Teaching Hospital Idi araba, Lagos where it was identified as *onchocerca volvulus*.

Follow up Visit 2

Patient returned on the 26th February 2020, feeling better after removal of the eye pad and was informed about the laboratory result after being counselled on onchocerciasis. She was referred to Centre for Disease Control in Lagos University Teaching Hospital Lagos to commence treatment on Tab Ivermectin 150mcg/kg taken as single dose with a repeat dose in 6 months after which she is to revisit for follow up. The disease surveillance response Team Lagos state was also notified so those living with her can be properly screened.

Follow up Visit 3

Patient returned on 15th August 2020, without complains. Subjective refraction revealed a lens of -0.50DS on BES with a VA of 6/6 and N5 in both eyes, which was ordered and prescription given for dispensing.

LABORATORY (Bacteriology)
 LAGOS UNIVERSITY TEACHING HOSPITAL
 REQUEST FOR LABORATORY SERVICES

Hospital No. [redacted] Path. No. [redacted]

Surname [redacted] Other Names [redacted] Age Ad Sex f Ethnic Group [redacted]

Clinician [redacted] Ward/Dept. [redacted]

Clinician Summary and Diagnosis [redacted]

Material [redacted]

Tests *Identification of parasite*

Date of Request [redacted] Signature of Doctor [redacted]

REPORT (For laboratory use only)

MACROSCOPY: *Specimen presented*

MICROSCOPY: Wet preparations & Cell Count Differential Count
 Gram Stain.
 Fluorescent Microscopy *Onchocerca volvulus Identified*

CULTURE INCLUDING BIOCHEMICAL TESTS:
 Sensitivity

Alp	PY	Pen	Strep.	Sul	N. Fur	Nov	Ery	Chlo	Tet	AP	GM	CP	CO	NA	TS	CX	FL

Med. Lab. Technologist [redacted] per kg

Comments: *Adequate treatment with Ivermectin 150mcg/kg stat repeat after 6mths.*

Figure 2: Image of Laboratory Result

Discussion

Onchocerciasis is spread from repeated bites of an infected blackfly and transmitted from person to person during a blood meal. Infective larvae inoculated into the skin during the bite of a blackfly develops into adult worms in 12 to 18 months manifesting in the skin by formation of nodules and dermatitis and in eyes causing complications leading to blindness. It is noteworthy that commonly related challenges within the endemic regions includes high poverty and illiteracy level, conflict and civil strife, loa loa co-endemicity, poor hygiene conditions and cross border migration. More than 99% of onchocercal infected people live in 31 African countries within sub-saharan areas though it is reported that some foci of the disease exist in 2 countries in South America (brazil and venezuela) and in Yemen. Prolonged infection of onchocerciasis promotes physiology more tolerant of the onchocerca volvulus presence as the degree of dermatitis is directly correlated with cytoadherence activity and cell proliferation in adult host, and inversely correlated with microfilarial loads [4]. The symptoms may result in itchy skin rash, eye diseases and formations of nodules under the skin. The most serious manifestation consists of lesions in the eyes that can lead to visual impairment and blindness.

The toxic effect of dead microfilariae worms usually induce focal corneal reaction which causes keratitis which repeatedly occurring leads to corneal scarring, corneal opacity and eventual blindness. Chronic uveitis may occur in onchocerciasis as a result of pannus formation as seen in sclerosing keratitis and congregation of inflammatory cells which extends to the corneal region not

applicable to this patient [5]. Onchocerciasis predisposes to secondary glaucoma as inflammatory changes due to eosinophils, plasma cells and lymphocytes released in response to dead microfilariae worms in the eye can cause peripheral anterior synechiae building up the individual's eye pressure but in this patient, the intraocular pressure was within normal range [6].

Earlier preventive measures employed was by the use of vector control method through onchocerciasis control program which was later supplemented by large scale distribution of Ivermectin in disease prone areas as this has drastically reduced the prevalence of onchocerciasis [7].

Diagnostic Investigation

The gold standard test for the diagnosis of onchocerciasis is the skin snip biopsy but for this patient, the worm was extracted from the subconjunctival space as there was no nodule found on the skin [8]. (Toe et al, 1998). Serological tests involving enzyme linked immunosorbent assay (ELISA) and western blot techniques are also acceptably used for detecting antibodies to onchocerca volvolus in skin, urine and tears though they are sensitive to filarial infection but not specific to onchocerciasis. The skin snip biopsy yields high specificity of 100% but low sensitivity of 20-50% especially in early stages of infection. There are other methods with lower specificity but sensitive in differentiating onchocerciasis such as antibody detection, antigen detection, nucleic acid amplification method and imaging studies of body tissues in nodulectomy. Test dosing can also be done with diethylcarbamazine in oral form but have been found to have multiple systemic toxicities which accelerates development of onchocercal blindness [9]. (Vincent et al, 2000).

Treatment

Prevention is the best control measure which is by avoiding being bitten by infected blackflies through use of insecticides containing N, N- Diethyl meta-toluamide (DEET) on exposed skin, wearing long sleeve shirts and permethrin treated clothings.

The treatment of onchocerciasis is multidisciplinary as it involves an infectious disease specialist, an ophthalmologist/optometrist and a dermatologist. Medical treatment involves the use of anti-parasitic and antibiotics medications. Surgical treatment involves carrying out a nodulectomy to remove adult worms where there is any found on the skin. The aim of medical therapy is to eliminate the microfilarial stage of disease to reduce symptoms, prevent progression of eye lesions and interrupt disease transmission. Ivermectin is the drug of choice for onchocerciasis as it reduces the burden of microfilaria and the risk of complications but does not cure the disease [10]. It is recommended combining short course of prednisolone (2-3 days) at the lowest dosage along with ivermectin as more frequent dosing with ivermectin (every 6 months instead of every 12 months) may reduce inflammatory complications because it does not permit microfilarial numbers to build up.

The use of doxycycline has also emerged in the control of onchocerciasis targeting endosymbiotic wolbachia as using a dosage therapy of 100–200mg/day for 6 weeks have shown great promise as it interrupts microfilarial embryogenesis, dramatically decreasing or eliminating microfilaria for at least 18 months after treatment. The combination of doxycycline and ivermectin given together is more effective than either drug prescribed alone especially in cases of severe ocular complications. The administration of ivermectin kills the microfilaria while doxycycline kills the macrofilaria. The usefulness of ivermectin for large scale treatment necessitated the administration of ivermectin for this patient. Onchocerciasis is rare in casual travelers as the infection is predominant in adventure

travellers, missionaries and other long-term volunteer workers in endemic areas due to regular exposure to the blackfly bites. Periodic ivermectin treatment will provide at least 80% therapeutic coverage to the population at risk complemented with vector control measures by additional surveillance or supervision of areas of predicted high prevalence to ensure sufficiently high coverage of interventions.

Conclusion

Onchocerciasis is an endemic problem as its prevalence is still high in Nigeria and it can be prevented by health education and increasing public awareness across the country. With the addition of doxycycline-mediated eradication of wolbachia species, there are options for treating this historically devastating disease [11,12].

Population-based prevention strategies should be instituted in endemic areas by elimination of blackfly vector and regular (every 6-12 months) mass ivermectin treatment of affected individuals. Travellers to areas where onchocerciasis is endemic should be counseled to use protective personal equipment or clothings treated with permethrin and insect repellants.

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