Ocular onchocerciasis in Malawi

A comparative study of 500 patients and 500 controls

I. BEN-SIRA AND Y. YASSUR

Department of Ophthalmology, Hadassah University Hospital, Jerusalem, Israel

Onchocerciasis in Malawi was first described by Gopsill (1939). This report and the only other one from Malawi (Harvey, 1967) dealt with the general picture and the skin manifestations of this disease. Eye complications have not so far been described.

A 3-year onchocerciasis survey in Malawi revealed a large endemic focus in the Cholo district. A previous communication dealt with the epidemiological aspects (Ben-Sira, Ticho, and Yassur, 1972). The present report describes the clinical picture based on a comparative study of 500 adults with ocular onchocerciasis. The ocular findings in this group were compared with those of another 500 adults from the same area, in whom skin snips confirmed the absence of infestation with *Onchocerca volvulus*.

Material and methods

The Cholo district, one of the richest districts in Malawi, offers favourable conditions for carrying out a survey. The majority of the adult population work on the tea estates and earn monthly wages. The soil is very fertile and malnutrition is rare. Two hospitals and several dispensaries cover the whole area. In two large projects, one for leprosy and the other for tuberculosis, the majority of the infected population has been discovered and treated. There are sufficient data concerning the type and prevalence of diseases in this area for it to be possible to establish the clinical picture of ocular onchocerciasis after the exclusion of other factors.

During the years 1968–1970, villages with a high endemicity rate, as well as villages from the periphery of the focus in the Cholo district, were investigated. The patients, usually adults, were examined for general signs of onchocerciasis. One skin snip from the outer canthus of the eye was taken and teased in normal saline. The specimen was immediately examined under the low-power microscope for living microfilariae (mf) of *Onchocerca volvulus*. If mf were not found at this examination, a second one was carried out 15 minutes later. If mf were still absent at this stage, a negative result was recorded, and the patient was included in the control series.

The ocular examination was carried out in the following way: the visual acuity was tested with a Snellen chart and pinhole. The intraocular pressure was measured with the Schiötz tonometer. Biomicroscopy of the anterior segment of the eye was done with the Haag-Streit 900 slit lamp. After dilatation of both pupils, the posterior segment was examined with Fison's indirect ophthalmoscope and the Zeiss direct ophthalmoscope, electric current being supplied by Land Rover batteries. If any ocular lesions were found in a control case, an additional six skin-snip examinations were performed to avoid a false negative diagnosis.

Altogether 500 cases of onchocerciasis and 500 controls were examined. The average age in each group was approximately 40 years. The ratio of males to females was 1.3:1.

Results

465 (93 per cent.) patients out of 500 in the onchocerciasis group exhibited *mf* in the anterior chamber, whereas in the control group no *mf* were found.

The visual results in both groups are summarized in Table I.

Table I *Corrected visual acuity in 500 onchocerciasis patients and 500 controls from the Cholo district, Malawi*

Vision	Eyes (per cent.)	
	Onchocerciasis	Control
6/6	58	66
5/9—6/12	18	21
6/18—6/24	5	5
6/24—6/60	5	2.6
6/60—3/60	7.6	2
Less than 3/60	6.4	2.4

Table II *Prevalence of pathological findings in patients and control subjects*

Result of examination	Eyes (per cent.)	
	Onchocerciasis	Control
Normal	35	85
Pathological	65	15

The differences in ocular pathology between the groups are shown in Table II. Table III shows the prevalence of various pathological findings in both groups. There is much more corneal involvement and iritis in the onchocerciasis patients than in the control group. Cataract and glaucoma, probably related to onchocercal eye lesions, were found in 20 and 12 per cent. respectively in the eyes of the onchocerciasis group as compared to only 4 and 2 per cent. respectively in the controls.

Table III *Prevalence of pathological findings in onchocerciasis patients and control subjects*

Condition	Per cent. of eyes	
	Onchocerciasis	Control
Conjunctival pigmentation	40	42
Fluffy corneal opacities	42	10
Complete corneal opacity	2	0.2
Staphyloma of the cornea	0.5	0
Microfilariae in anterior chamber	93	0
Flare in aqueous	30	0.4
Keratic precipitates	22	0.2
Pear-shaped pupil	35	0
Peripheral anterior synechiae	17	0
Posterior synechiae	34	0.2
Iris atrophy	37	0.2
Pseudoexfoliation of lens	4	0
Progressive cataract	15	2
Mature cataract	3.3	1.2
Glaucoma, primary and secondary	12	2
Opaque vitreous	3	0
Choroidal atrophy	0.8	1
Chorio-retinal scars	0.2	0.4
Optic nerve atrophy	0.5	0.3
Phthisis bulbi	0.5	0.2

25 (5 per cent.) bilaterally blind patients and fourteen unilaterally blind patients were encountered in the onchocerciasis group as compared to only nine (1·8 per cent.) bilaterally blind and six unilaterally blind in the control group. The main causes of blindness are listed in Table IV.

Table IV *Causes of blindness in onchocerciasis patients and control subjects*

Cause of blindness	No. of eyes	
	Onchocerciasis	Control
Corneal opacity	10	1
Staphyloma of the cornea	2	0
Cataract	33	12
Glaucoma	16	6
Opaque vitreous	3	0
Optic nerve atrophy	5	3
Phthisis bulbi	5	2
Total	65 eyes (25 bilateral)	24 eyes (9 bilateral)

Discussion

The present study describes the clinical picture of ocular onchocerciasis in Malawi for the first time. The study was carried out on a population with a relatively high standard of living and a good nutritional state. Comparison of the onchocerciasis patients with a control sample from the same area and of the same age group established the relative importance of onchocerciasis as a cause of ocular pathology and blindness. In the Cholo district, Malawi, onchocerciasis was responsible for 77 per cent. of eye disease and 62·5 per cent. of blindness. The eye lesions in our patients were of the same character as in other endemic foci (Hissette, 1938; Ridley, 1945; Rodger, 1958; Budden, 1957), but the prevalence and severity of those lesions differed considerably. Senile cataract was the most important cause of blindness in our group of onchocerciasis cases. The second important cause was glaucoma which appeared in the majority of the cases to be the chronic simple type. Corneal opacity (onchocercal) was only the third important cause of blindness. Posterior segment lesions were rare and contributed very little to the whole picture. There is still a great deal of controversy as to the exact type and situation of eye lesions in ocular onchocerciasis, but few reports have been based on comparative studies taking into account the effect of communicable diseases, state of nutrition, and special habits on the development and appearance of the eye lesions. Choyce (1964) discussed some possible reasons for the wide variations in the ocular picture of onchocerciasis. In our opinion, it is premature to draw any conclusions when such varied criteria for differential diagnosis are still used and comparative studies so rare.

Summary

- (1) A first report is given of the clinical picture of ocular onchocerciasis in Malawi.
- (2) This report is based on a study of 500 adult onchocerciasis cases with microfilariae of *Onchocerca volvulus* in the anterior chamber.
- (3) The ocular findings are compared with those of 500 control subjects from the same area and of the same age group.

- (4) Ocular onchocerciasis is responsible for 77 per cent. of eye lesions and 62·5 per cent. of blindness in the Cholo district, Malawi.
- (5) 5 per cent of the onchocerciasis patients are blind; the main causes are: operable cataract, absolute glaucoma, and corneal opacity, all of which are apparently caused by iridocyclitis.
- (6) Few posterior segment lesions were seen among the inhabitants of the Cholo district, Malawi.

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