THE BRITISH JOURNAL

OF

OPHTHALMOLOGY

OCTOBER, 1946

COMMUNICATIONS

THE INCIDENCE OF TRACHOMA IN THE SOUTHERN HIGHLANDS PROVINCE OF TANGANYIKA*

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Introduction

IN an earlier paper¹ I drew attention to the importance of trachoma in connection with the schemes for educating Africans that were then under discussion. In that paper I emphasized its importance as a cause of defective vision and endeavoured to collect the available information concerning the incidence of this disease in East Africa, but I found that few statistics were available. A group of 1,000 African school children in the Kampala district of Uganda had been examined by Stones² and he found that 13 per cent. were infected. Harley-Mason very kindly sent me his statistics dealing with the attendances at the Nairobi Eye Clinic in the years 1941, 1942 and 1943 which showed that 15 per cent. of the 9,836 Africans seen during this period had the disease. When I wrote the paper in 1944 these were the only figures dealing with the incidence of trachoma that I was able to obtain.

In this paper I wish to record the results of a brief survey of the Southern Highlands Province in Tanganyika which was carried out intermittently as time permitted during the later months of 1945. Most of the work was done in my own district, Iringa, but I was able to examine the children in a few schools in Chunya, Tukuyu

* Received for publication, April 19, 1946.

and Mbeya districts. It is hoped that this survey will give some indication of the incidence of trachoma in the Southern Highlands Province and assist further investigation into the problem.

The Southern Highlands Province

The situation of the Southern Highlands Province and the places visited are shown on the accompanying map. The province as a whole is at an altitude of between 5,000 and 6,000 feet above sea

level. All the schools I visited were situated within this range with the exception of Malangali which is at a lower altitude. The climate varies considerably in different areas of the province, but with the exception of Igali and Rungwe which are moderately cold and have a high rainfall, all the places visited in this survey have similar climates, with hot noon temperatures, cool evenings and a yearly rainfall of about 30 inches, all of which falls between November and the following April.

The area and population of the various districts in the Province can be seen from the following table :—

District	Area in Square Miles	Africans	Head of Cattle
Mbeya ...	11,043	125,000	165,801
Iringa ...	14,057	105,000	188,207
Rungwe ...	1,885	155,000	91,567
Njombe ...	7,996	130,000	92,006
Chunya ...	11,063	29,000	12,083
	46,044	544,000	549,664

The great differences in density of population are obvious; for example, in Rungwe district there are 81·5 people to the square mile, whilst in Chunya district there are only 2·6 people to the square mile. This, of course, reflects the fertility of the district and in the two cases cited Rungwe is naturally very fertile whilst Chunya is barren. It follows that the Wanyakusa tribe of Rungwe eat a good mixed diet and are a healthy tribe. It will be seen that this tribe showed the lowest incidence of trachoma and it may be that their good mixed diet is a factor of some importance in that it increases their general resistance to disease.

For six months of the year there is no rain in most districts so that water is scarce, the dry winds raise clouds of dust and the natives wash infrequently. In Rungwe, however, there is always water, there is little or no dust and the Wanyakusa are cleaner in their habits, dress and persons than the inhabitants of the other districts. Trachoma is a disease which is certainly favoured by dirty habits so the shortage of water during the dry season would appear to have some bearing on its prevalence.

In most districts in the province cattle-herding is the chief occupation. Almost as soon as an African boy is able to run about he spends his day watching the cattle. This is probably of some importance in connection with trachoma because wherever cattle are found flies are common and one has only to see them clustering undisturbed about the discharging eyes of African babies to realise how flies assist the spread of the disease. The district of Rungwe is an exception in that here agriculture is as important if not more important than cattle raising. The head of cattle in comparison to population can be seen in the foregoing table; for example in Iringa district there are 1·8 cattle per person and in Rungwe only 0·6 cattle per person. Furthermore, in many parts of Rungwe district the coffee and tea plantations are supplied by the Africans with cattle dung for manure and so the breeding grounds for flies are reduced. Whatever the causes, the numbers of flies appear to be less in Rungwe district than in most other districts in the Southern Highlands Province.

Diagnosis

During this survey I used for examination a corneal loupe and a hand slit-lamp connected to a car battery. My procedure was to examine the cornea and the lower fornix and then evert the upper lid and examine the upper fornix of each eye in turn. All cases were classified according to MacCallan's classification³ as follows:—

TR I Subepithelial lymphocytic infiltration with or without lymphoid follicles.

TR II The stage of complication with the development of conjunctival blebs or papillary hypertrophy.

TR III The onset of scarring and the absorption of lymphocytic infiltration.

TR IV Complete cicatrization with no apparent inflammation.

MacCallan considers that the presence of pannus is pathognomonic of trachoma but since some difference of opinion appears to exist in East Africa concerning the criteria on which to base the diagnosis I have followed the example of other writers and have classified as "doubtful trachoma" those cases in which there was pannus only and no other apparent sign. In my opinion, however, these were definitely cases of trachoma, and, had a slit-lamp and corneal microscope been available, I believe the majority of them would have shown certain signs of being so. All cases classified as positive therefore, showed, in addition to pannus, lymphoid follicles, hypertrophied conjunctiva, Herbert's pits, Arlt's line, corneal facets or other unequivocal indications of the presence of trachoma.

Graham Scott⁴ found a considerable number of cases in which pannus was the only indication of trachoma. He also classified

these cases as "doubtful trachoma" and stated that he considered that these cases represented "TR IV or stage IV of a mild infection which has healed without complications." This would certainly seem to be the case because almost all African children of one or two years of age who have the disease show a marked conjunctival reaction with numerous follicles, whilst the majority of African children a few years older show pannus as the chief sign and the conjunctival reaction is much less marked. This surely indicates that a few years after the onset of the infection the conjunctival inflammation tends to resolve leaving the pannus as the most obvious sign of trachoma.

Place	Total	Negative	Doubtful	Positive	Marked	Percentage Positive	Percentage Marked
Njombe (adult labourers)	71	47	6	18	2	25.3	2.8
Mbeya (children) ...	174	69	34	71	15	40.7	8.6
Chunya (children) ...	59	18	2	39	7	66.0	11.8
Igali (children) ...	180	100	23	57	12	31.7	6.7
Rungwe (children) ...	191	151	14	26	2	13.7	1.1
IRINGA DISTRICT							
Iringa (children) ...	104	20	12	72	16	69.2	15.3
Malangali and Utenguli (children) ...	535	221	87	227	19	42.4	3.5
Malangali (adults) ...	214	66	20	128	31	59.8	14.0
Tosamaganga (children)	1,092	300	134	658	215	60.2	19.6
Kalenga (children) ...	119	12	3	104	45	87.3	37.8
Kalenga (adults) ...	438	112	16	310	78	70.7	25.1
	3,177	1,116	351	1,710	442	53.8	13.9

Discussion

Duke-Elder⁵ has stated that trachoma is rare among negroes, but Graham Scott has shown that from 5 per cent. to 25 per cent. of West African negroes are infected, the infection rate varying from district to district. On the whole the disease is of a mild type and disabling complications are not common.

In my series 3177 adults and children were examined and 1710

or 53·8 per cent. were found to be infected. All these Africans were members of the various Bantu tribes living in the Southern Highlands Province. These figures show that the disease is very common but it is mild in type, and frequently so mild as to give rise to no symptoms of discomfort. This comparative lack of symptoms probably explains why the disease has been considered rare amongst Africans.

The "marked" cases are those which were sufficiently severe to give rise to symptoms likely to trouble the patient or to complications that might lead to defective vision so that under this heading were included such cases as those in which the lids were thickened, the conjunctiva was hypertrophied and thrown into papillary folds or in which pannus threatened to involve the pupillary region of the cornea. Thus, of the 3177 only 442 or 13·9 per cent. ran any real danger of developing incapacitating complications.

Of the 438 adults examined at Kalenga 30, or 6·8 per cent. had such disabling lesions as leucomata, staphylomata and entropion in one or both eyes, conditions which were most probably the direct result of their trachoma, while of the 214 adults at Malangali 12 or 5·6 per cent. were similarly affected. Entropion occurred in nine of the cases at Kalenga and in two cases at Malangali. Almost all of these Africans were members of the Wahehe tribe whose chief occupation is cattle-herding and this tribe showed the highest incidence of all the tribes examined in this survey.

There is an apparent discrepancy at Malangali between infection rates of adults and children viz: 59·8 per cent. and 42·4 per cent. respectively. If the figures for marked cases are taken the difference is even more noticeable, 14 per cent. in adults and 3·5 per cent. in children. Malangali school is the chief African Government school for the whole of the province and is composed of some 384 children of whom about one half are boarders. In this report the 151 children from Utenguli Mission school a few miles away are included for convenience, bringing the numbers up to 535. All the boys in the upper classes of the Government school are picked students of about 18 to 20 years of age sent to Malangali from all parts of the province for special training. Examination of the figures for the school show that in 190 children in the lower classes, the majority of whom were day scholars, nine "marked" cases were found, whilst in 193 boys in the upper classes most of whom were boarders, only three "marked" cases were found. The percentages of "marked" cases are therefore as follows:—

Children :

Lower forms	...	4·7 per cent.
Upper forms	...	1·5 " "
Adults ...	...	14·0 " "

These figures seem to indicate that:—

1. The natives of Malangali district have a high infection rate.
2. With the hygienic habits and good food which accompany boarding at Malangali school the disease tends to resolve.
3. Boys with trachoma sufficiently severe to cause symptoms find it a considerable handicap in their studies and drop out in the keen competition to be chosen for specialised training.

Bitôt's spots were seen in two boys at Utenguli Mission School, Malangali, and in one village schoolboy at Tosamaganga. These also showed some lack of lustre and wrinkling of the conjunctiva, but no other signs of vitamin A deficiency were observed. I should mention, however, that observations were confined solely to an external examination of the eyes and the children were not questioned as a routine concerning night-blindness.

Herbert's pits and corneal facets were seen quite frequently amongst adults and adolescents.

Effect of Climate

The climate does not appear to have much effect upon the incidence of the disease. Towards the end of the dry season in Iringa more Africans attended the hospital complaining of discharging eyes. Most of these, however, were cases in which a Koch-Weeks infection was superimposed upon trachoma. This, by causing a profuse muco-purulent discharge, would undoubtedly render a case of trachoma more infectious and assist in the spread of the disease.

The rainfalls of the various places visited are given below with the percentage of positive cases:—

Place	Average Yearly Rainfall in Inches	Percentage Positive
Rungwe ...	76'49	13'7
Chunya ...	31'67	66'0
Mbeya ...	35'87	40'7
Malangali ...	31'62	42'4
Tosamaganga	30'20	60'3
Iringa ...	30'42	69'2

Only in the case of Rungwe is there any marked difference in rainfall and a corresponding difference in the incidence of trachoma. Whilst this may appear to be suggestive these figures were examined statistically by Dr. A. D. Harris and no significant statistical correlation between rainfall and the incidence of trachoma could be found. This, however, is to be expected because the type of climate appears to have no marked effect upon the incidence of the disease in other countries.

Summary

1. Trachoma affects about 50 per cent. of the Africans of the Bantu tribes in the Southern Highlands Province of Tanganyika.

2. The incidence rate varies considerably from 13·7 per cent. in the Rungwe district to 87·3 per cent. in the neighbourhood of Kalenga.

3. Diet, dust, the personal habits of cleanliness, and the occupation of cattle raising and the associated swarms of flies are probably factors affecting the incidence rate.

4. On the whole the trachoma seen in the Southern Highlands Province is a mild disease.

I wish to record my gratitude to Dr. A. G. Mackay, Senior Medical Officer, Southern Highlands Province, for his encouragement and for assisting me by undertaking my duties whilst I visited the schools outside my district; to Mr. R. Stowell, Inspector of Schools, Malangali, and to Fathers Gerard and Sciolla of Tosamaganga Mission for much assistance.

I am indebted to the Director of Medical Services, Tanganyika, for permission to submit this paper for publication.

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