TRACHOMA IN WEST AFRICAN NEGROES*

BY

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ALTHOUGH no race is immune from trachoma (MacCallan, 1936) it is thought to be rare among negroes (Duke-Elder, 1943).

Only in recent years has the prevalence of the disease among West African negroes been recognised.

The purpose of this paper is to assess the rate of infection among negroes in British West Africa and to describe the disease as it affects the native.

Previous reports

The earliest suspicion of trachoma in West Africa is aroused by the report of an outbreak of "ophthalmia" on the slave ships *Le Rodeur* and *El Leon*, Guillie (1820). Mackenzie (1845) quotes this as an example of contagious or Egyptian ophthalmia (distinct from gonorrhoeal ophthalmia, though either type might be complicated by granular conjunctiva or trachoma).

Such an outbreak was not uncommon on slavers (Harold Scott, 1938) and since it not infrequently resulted in blindness, it was looked upon with dread by the crew.

Pergens (1898), Talbot (1927), and Deplanche (1931), found very little trachoma among negroes in West Africa, although Talbot found it endemic in North Cameroon, chiefly affecting Arabs *e.g.*, 8 per cent. in a Musulman school at Tibati.

Reviewing the position in French Colonies Motais (1926) stated that little or no trachoma had been found below 11° N. but that it was prevalent above this latitude.

He quoted cases at Dakar, 33 per cent. in schools at Mopti, and 10 per cent. among conscripts from Lake Chad.

Marque (1939) considered that the disease had spread when, in 1936, he found reports of many cases below 11° N. (*i.e.*, in all French Colonies along the coast from south of Dakar to the Cameroons).

In a survey of British colonies MacCallan (1936) stated that no case had been noted in the Gambia or in the Gold Coast and that much conjunctivitis had been reported in Sierra Leone. In the latter colony Robertson, (1938) found that 70 of 109 cases of conjunctivitis had trachoma.

In Nigeria 136 to 217 cases of trachoma were reported in the annual medical reports from 1935 to 1939. Dodds (1942) at Lagos found that 66 of 198 cases of conjunctivitis had trachoma.

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Work on the incidence of trachoma in Gambian schools by Carmichael Wilson was interrupted by war but agreed with the 5 per cent. figure given in this paper (personal communication).

Author's cases

Trachoma in West African negroes is a mild disease, despite the fact that such debilitating diseases as malaria, yaws, and ankylostomiasis are prevalent.

Following the work of MacCallan, (1908-39) and of Wilson, (1927-38), pannus was taken as the keystone of diagnosis. When sub-epithelial infiltration or scarring were also present, trachoma was diagnosed. When changes other than pannus were not recognisable, the case was labelled "doubtful trachoma."

As will be shown, these are cases of healed trachoma and resemble the "sub-clinical" cases described by McKelvie (1941) in natives of the Sudan.

Cases of spring catarrh and of follicular conjunctivitis are confusing, as fingers of the normal limbal ring of pigment are apt to be confused with neo-vascularisation. With experience no difficulty was found in differentiating the two.

DISTRIBUTION

				Trachoma	Doubtful trachoma	Total per cent.
GAMBIA						
1,114	School children.	(Bathurst)		46	27	6.5
80	School children.	(Georgetown)		15	6	26.2
500	Soldiers	...	...	41	18	11.8
284 Civilians:						
50	Bondalli	...	...	20		
42	Sintet	...	...	14		
33	Jawara	...	...	10		
50	Kanuma	...	...	12		
33	Basse	...	...	3		
26	Kanfinda	...	...	5		
50	Lamin	...	...	7		
284				71		25.0
GOLD COAST						
375	Soldiers	...	...	37	15	13.9
NIGERIA						
500	Soldiers	...	...	41	18	11.8
CAMEROONS						
300	Soldiers	...	...	5	2	2.7

In round figures one may say that 5 per cent. school children, 10 per cent. soldiers, and 25 per cent. in some villages are infected in the Gambia. (The first three villages in the list were picked

out during a survey by Captain D. McGowan, R.A.M.C., as presenting more blind people than usual.)

One may say that 10 per cent. of Gold Coast and of Nigerian soldiers, and 2 per cent. of Cameroon soldiers are infected. These cases differed in no way from those studied in Gambians.

Two soldiers from a regiment of American negroes stationed in Liberia developed a similar trachoma after three months in that colony.

Naked eye examination of 300 men from the regiment revealed no further cases and the medical officer had seen no similar cases.

Differential diagnosis

It has been noted that one-third of the cases were diagnosed as "doubtful trachoma." In such cases, pannus or the vessels resulting from a cleared pannus were the chief or only signs of trachoma.

In many cases, examination with the slit-lamp microscope established the presence of fine scarring of the palpebral conjunctiva, but in other cases no change from normal was seen.

The possible factors considered were: 1, congenital syphilis; 2, syphilitic keratitis; 3, ariboflavinosis; 4, tropical diseases; 5, normal variation.

Factors 1 and 2 are difficult to exclude in a yaws infested country where the Kahn test is positive in roughly 30 per cent. of the population.

The following facts render improbable the diagnosis of syphilis:—

(a) No case presented signs of congenital syphilis. (b) The Kahn test was negative in 27 of 42 cases of doubtful trachoma (compared with a negative Kahn in 16 of 42 non-trachoma eye cases). (c) In 26 non-trachoma cases with a positive Kahn no corneal vascularity was seen. (d) A full course of injections of N.A.B. given to 10 cases of doubtful trachoma with positive Kahn resulted in slight improvement in one case only (such improvement was reported in mixed infection by Cornet, 1937).

It is concluded that neither syphilis nor yaws is more than a mild contributing factor in a small proportion of cases.

Factor 3.—To exclude ariboflavinosis, 6 cases with perleche and cheilosis as well as corneal vascularity were subjected to a therapeutic trial with 9 mgs. riboflavin daily for 21 days. Perleche and cheilosis were cured in all, but in no case was the vascularity improved.

Furthermore the vessels were only found in the upper and lower arcs of the cornea and were not evenly distributed around the limbus.

Thirty-six of 280 boys and 15 of 280 girls had angular stomatitis

but corneal vascularity was not more among these cases than among the others.

Only a few girls and one boy had phrynoderma. There were no Bitot's spots or other signs of vitamin A deficiency in the Bathurst school children.

It is concluded that vitamin deficiency is not a factor.

4. In 150 cases of trypanosomiasis and in 300 cases of onchocerciasis corneal vascularity due to the disease was an exceedingly rare complication, although both diseases had the expected proportion of cases with trachomatous pannus. None of the children presented signs of either disease and it is concluded that such tropical diseases are not a factor.

5. (Wilson, 1932) described normal limbal vessels and noted cases of "advanced limbus." (Stannus, 1944) found it quite impossible, owing to the great variability, to formulate any satisfactory method of notation for describing the degree of vascularity of the limbus and cornea.

(Cuenod and Nataf, 1934) noted an extension of the limbic plexus, particularly among young negroes, which they attribute to the remains of foetal vessels.

Such possibilities cannot be discounted, but having seen Tr. 1 clear up leaving only a fringe of vessels extending beyond the ring of pigment, it is my opinion that the great bulk of these cases of "doubtful trachoma" represent Tr. 4 or stage 4 of a mild infection which has healed without complications.

Description of cases

Based on the examination of 300 cases of trachoma, some seen during the survey, others seen as out-patients or as in-patients at a military hospital, and on the re-examination after six months of 57 infected children and of 61 soldiers, the following description of trachoma in West Africa is compiled.

The children and villagers were examined with binocular loupe and the soldiers by slit-lamp. The four stages described by (MacCallan, 1936) served in classifying.

In brief. Tr. 1 is the general lymphocytic type. More than half the cases pass to Tr. 3 without complications.

Tr. 2a is exceptional.

Tr. 2b is difficult to distinguish from Tr. 1 as papillary hypertrophy is often slight.

Tr. 3 is recognised by scarring, but re-infection probably occurs not infrequently.

Tr. 4 requires no comment.

In detail. Tr. 1.—The onset is insidious. One rarely elicits any complaint or previous history on questioning. The disease is

well established in 5 year old children and the onset in early childhood is assumed. Girls are more commonly affected than boys. Thirty-four of 400 girls and 39 of 714 boys (including doubtful cases) were affected. Tr. 1 is of the general lymphocytic type, giving a red or purple thickened velvety upper palpebral conjunctiva.

Follicles are rarely visible by naked eye but in some cases can be found with magnification.

Pannus is visible on magnification, associated with varying degrees of corneal haze seldom affecting vision.

Tr. 1 was observed to clear completely in 2 cases.

Some cases become secondarily infected and pass to stage 2.

Many cases evolve directly to stage 3, some with the mildest permanent lesions and others prone to relapse or re-infection (with trachoma).

Tr. 2a.—This stage is a rarity. Only 2 cases were seen with bleb-like excrescences. Both were children.

Tr. 2b.—In the absence of an obvious conjunctivitis, stage 2b is difficult to differentiate from Tr. 1 (general lymphocytic type) as the papillary hypertrophy is seldom well marked.

Many soldiers were seen on routine examination with no secondary infection and no history of recent conjunctivitis, yet presenting velvet, red, or purple, palpebral conjunctiva and pannus.

Slit-lamp examination showed varying degrees of papillary hypertrophy and sometimes a trace of scar tissue.

Whether this represented a re-infection (Tr. 1) of an old case or a true Tr. 2b, or whether Tr. 1 can persist for many years, cannot be determined without further study.

Raspberry-like processes were seldom seen by naked eye, not even in cases which had a secondary conjunctivitis, though papillary hypertrophy was visible with magnification in these cases.

Secondary infection is uncommon. It was found in less than 1 per cent. of all cases diagnosed as trachoma on routine inspection. Only 8 of 22 hospital cases had a purulent conjunctivitis though the remainder had a watery discharge.

Cornea in Tr. 1 and 2b.—Pannus is superficial to Bowman's membrane and is tenuous in type. It is seldom visible to the naked eye. Active pannus is often preceded by an area of infiltration.

In a few cases follicles resulting in Herbert's pits (Herbert, 1904) are seen at the limbus. The cornea may become abraded and oedematous but intractable ulcers seldom develop. These abrasions stain with fluorescein, but deeper infiltrates also develop, leaving nebulae resembling the nebulae of onchocerciasis.

Facets seldom form but the nebulae interfere with vision to a greater or less degree.

The majority of such cases quieten after some weeks, though attacks tend to recur and to damage vision if untreated. It was estimated that about 5 per cent. of all military cases of trachoma required hospital treatment during one year.

Tr. 3.—When the active stage is over (and this occurs in the vast majority of cases without treatment) the pannus regresses. The number of affected adults who present superficial vessels extending well into the upper and sometimes lower half of an otherwise clear cornea is surprising. But for the absence of an associated iritis or choroiditis one might well think of congenital syphilis. However, the continuity of the corneal vessels with the conjunctival vessels rules this out.

In milder cases, the pannus does not advance much beyond the limbus, and when such cases quieten the only sign remaining is a superficial vascularity confined to the upper arc of the cornea. Even this tends to fade and some such cases diagnosed as doubtful trachoma present a faint striate keratitis on re-examination in which the vessels are not visible.

The palpebral conjunctiva of some cases in stage 3 presented areas of purple thickening cut off by lines of scarring, giving a marbled appearance.

This "marbling" was also seen after the hyperaemia in some hospital cases had quietened and led to the conclusion that relapse from Tr. 3 to Tr. 1 was not uncommon in cases uncomplicated by bacterial infection.

Palpebral scarring in children is often difficult to detect, but it is nearly always present in adults.

Scar tissue is minimal in some cases and, though easily recognisable by naked eye in others, seldom leads to gross deformity of the lid.

Arlt's cicatricial line (Arlt, 1881) is seen and such cases may present some buckling of the lid, but trichiasis is uncommon.

Of 100 cases, 8 had trichiasis, 12 had ptosis, and 3 had a sinuous lid border as described by Herbert, (1907).

One native with trichiasis had practised self-epilation for many years.

Trichiasis with badly scarred cornea is seen in some village women, less often in men.

Among soldiers with trachoma, though many had some diminution of vision, only 1 in 100 was unfit for service on account of corneal opacities or facets.

Tr. 4.—Stage 4, when no further inflammatory activity is evident, is usually free from serious complications.

Influence of climate

In the Gambia there are three well marked seasons.

1. - From July to October there is heavy rainfall when insects are plentiful.

2. The rest of the year is dry.

3. In January or February there is a period of hot, dry, dusty wind.

No seasonal incidence of trachoma occurred.

Exceptional cases

(a) Healing without scar. (b) Uni-lateral case. (a) Two children were seen 8 months and again 12 months after Tr. 1 had been diagnosed. In both cases healing had occurred with no evidence of damage. The identity of the children was established and there is no doubt that in the two cases the sub-epithelial infiltration and pannus had regressed leaving no sign. Other children who present only vessels in a healthy cornea support the view that healing without scarring can occur.

(b) With one exception, all the cases examined were bilateral. The exception was a Gold Coast sergeant. He had been to school and was quite certain that he had no eye trouble previous to his service in East Africa in 1940. There his left eye became inflamed and he received treatment for 14 days from the unit medical officer. He had a second attack in 1941 which subsided without treatment in 10 days. He had a third attack in 1942 when he was sent to me after 10 days' treatment at his unit.

The left upper lid was ptosed and the palpebral conjunctiva was thickened, red and velvety. Pannus of the upper third of the cornea could be seen by naked eye. Slit-lamp examination showed "a white mass on the cornea raised like snow in front of a vascular plough." There was no general conjunctivitis and he only complained of slight pain. There was no serous or purulent discharge, but examination led to profuse lacrimation.

The whole cornea became opaque in one month although the palpebral conjunctiva settled to "slight congestion with no follicles."

Pannus began to fade but the corneal opacity persisted and vision was reduced to 6/60. At no time during his two months in hospital was there any abnormality of the right palpebral conjunctiva or cornea and no evidence of past or present pannus could be seen with the slit-lamp.

Pathological investigations

Conjunctival scrapings were examined in a series of 30 cases of Tr. 2 and Tr. 1. Inclusion bodies were seen in 13 cases. In

a control series of 20 healthy eyes similar bodies were found in 3 cases. Further work requires to be done on this point and on the early epithelial changes described by Taborisky (1930-32).

Treatment

Cases discovered on routine examination were not treated but were kept under observation. Most cases were unchanged on re-examination; some had improved; very few were worse. In some children and in a few adults only careful examination revealed pannus six months later.

Cases in Stage 3 were treated at first with copper sulphate. They compared so badly with untreated cases that this treatment was stopped.

Atropine 1 per cent. and protargol 10 per cent. drops were used for hospital patients and the average case cleared up in 10 or 14 days.

They were detained for a further week as it was found that a relapse occurred if cases went out too soon. This treatment was found satisfactory. Full doses of sulphapyridine by mouth did not hasten improvement.

Two cases were quite intractable and after 100 days in hospital had to be boarded out of the army.

As complications are so mild and as the disease tends to settle down on its own, it seems advisable to direct treatment first to preventing the spread of the disease by improving social and hygienic conditions and secondly to treating secondary infections if and when they occur.

Summary

1. Trachoma of the West Coast African negro is a mild disease.
2. It is of the general infiltrative type.
3. It affects 5 per cent. school children, 10 per cent. soldiers and 25 per cent. of some villages in the Gambia.
4. The same disease is found in 10 per cent. Gold Coast, in 10 per cent. Nigerian and in 2 per cent. Cameroon soldiers.
5. Three hundred American negro soldiers had no similar infection, but were not immune.

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"THE ANTIQUITY OF OPHTHALMOLOGY"

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PRIOR to the Greek period Egyptian medicine was regarded very highly; and was considered as the commencement of practical and clinical medicine. In fact one of the Greek writers commends specially the wisdom of the Egyptians, and the Odyssey contained the statement that the physicians of Egypt were skilled beyond

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