CLINICAL REVIEW

Eye survey—Mrewa Trust Lands

S. W. JAMIESON

St Mary's Hospital Medical School, London, W.2

Summary

In a remote area of Rhodesia, 4051 rural Africans were examined. Emphasis was placed on examination of the eye although attention was also devoted to any other complaints. The main finding was of a follicular conjunctivitis, two-thirds of these cases being judged to be due to trachoma. Pathology was found more frequently in the younger patients, in whom there was a high incidence of acute purulent conjunctivitis. In older patients cataract and conjunctival growths were found to be common. Many patients had multiple disorders.

Malnutrition and vitamin deficiencies were also seen and treated, and many other medical disorders were recorded.

The major weapon in combating general infection and eye disease would be a basic education in hygiene, and this is being put into practice.

Introduction

Whilst on a 3-month study period in Rhodesia, 4 weeks were spent in a large area of Tribal Trust Land north-east of Salisbury. During this time the area was extensively travelled by the author as medical officer and two African health assistants trained in public health and attached to the district.

The team had three main aims;

1. To determine the extent and nature of eye disease in the area.
2. To treat eye disease where possible, and to refer those requiring surgical treatment.
3. To look for other diseases, especially leprosy.

The terrain of the Trust Land varies from flat plain-lands, where most of the inhabitants dwell, to mountainous areas. The rain falls only in the summer months, and the weather is hot and the atmosphere dusty. The inhabitants are traders or farmers, and mostly live in very primitive conditions.

Procedure

Travelling was done in a Land-Rover which carried basic medical supplies and equipment. A clinic was held daily at a central place, after which

the team would travel to another district and camp. During the evening the health assistants would tour the immediate vicinity and ensure that all knew of the clinic to be held the next day. We travelled according to a fixed schedule, and this enabled people to come from very remote places to a central spot on a day which was advertised by the chiefs, kraal-heads and our health-assistants who sent messages ahead. It was emphasized that we wished to see everybody, and not just people with complaints.

Each person seen was asked if she or he had any complaint, after which the face, chest, back and limbs were examined for rashes or any other lesions. The general appearance and state of nutrition of the patient were noted. A full medical examination was performed when this was indicated by the history. In all patients the eyes were then examined methodically, noting first any difference in symmetry, size or colour, or any difference in the size of the pupils or palpebral fissures. After noting the eye movements and reactions of the pupils each eye was examined in turn, looking especially for lid, corneal or conjunctival lesions. The upper eyelid was always everted to examine for trachoma or foreign bodies. A bright light was used to look for lens opacities. The fundus was examined only in patients in whom the examination thus far suggested that ophthalmoscopy might prove rewarding, or in elderly patients. The pupil was not dilated for the examination and usually ophthalmoscopy took place under a tree in moderately bright light.

The intra-ocular tension was assessed digitally and finally the patients were made to read the number plate of the Land-Rover parked end-on 25 yards away. If patients had very poor sight they were made to attempt to count fingers (CF) at varying distances, to observe hand movements (HM) or to perceive a bright light or the sun (PL). Refractive errors were roughly checked by means of an ophthalmoscope. Slit-lamp examination was not available.

Finally a note was made of the age and sex of the patient, together with any findings, and their names and addresses if they were to be referred, either to

TABLE 1.

	Total		Aged 0-5		Aged 6-15		Aged 16-49		Aged 50+	
Total examined	4051		649		2480		740		182	
<i>Eyes:</i>										
Normal eyes	1563	38.6%	153	23.6%	1085	43.8%	302	40.8%	23	12.6%
External lid infections	10		4		5		1		0	
Follicular conjunctivitis of these	1180	29.1%	280	43.1%	801	32.3%	85	11.5%	14	7.7%
Probable trachoma	850	21.0%	196	30.2%	573	23.1%	71	9.6%	10	5.5%
Trichiasis	1		0		0		0		1	
Acute purulent conjunctivitis	103	2.5%	92	14.2%	7	0.3%	4	0.5%	0	
'Sclerosed conjunctiva'	407	10.0%	8	1.2%	372	15.0%	27	3.6%	0	
Non-specific conjunctivitis	564	13.9%	34	5.2%	344	13.9%	186	25.1%	0	
Pterygia and/or pinguecula	215	5.3%	0		14	0.6%	80	10.8%	121	66.5%
Corneal ulcers	2		1		1		0		0	
Leukomata	33	0.8%	4	0.6%	13	0.5%	11	1.5%	5	2.7%
Unilateral traumatic blindness	15		2		8		5		0	
Severe cataracts (HM or CF)	8		0		0		0		8	4.4%
Moderate cataracts (Hazy sight or PL)	33	0.8%	0		0		6	0.8%	27	14.8%
Foreign bodies	51	1.3%	9	1.4%	35	1.4%	6	0.8%	1	0.5%
Strabismi	3		2		1		0		0	
Refractive errors detected	6		0		0		1		5	
Staphyloma	1		0		1		0		0	
Totally blind (excluding cataracts)	5		0		2		1		2	

Harare General Hospital in Salisbury for general medical or surgical conditions, or to the Ministry of Health in the event of an eye condition requiring surgical treatment.

Special attention was devoted to the discovery of blind patients, and all those examined were asked if they knew of any blind people. All such cases were seen, and their names and addresses recorded. They were referred for surgical treatment where this was indicated. It was often necessary to make a special trip to see relatively immobile patients, whether these were sick or blind, and this usually entailed walking through the bush.

The four hospital clinics in the area were visited and often medicines were borrowed from them. Where possible the nurses or medical assistants staffing the clinics attended our sessions and took the names of those put onto a course of treatment.

Findings

4051 patients were examined, of whom 2108 were males. The age distribution of these patients and the main findings are given in Table 1.

The healthiest group seen were those between 6 and 15 years of age. The younger patients often had a follicular conjunctivitis, trachoma or acute purulent conjunctivitis, whilst the older ones often had a non-specific conjunctivitis, pterygia or cataract.

29% of all patients seen had a follicular conjunctivitis, of which two-thirds were noted as trachoma. 43% of the 0-5 age group and 32% of the 6-15 age group had a follicular conjunctivitis, 30% and 23% respectively having lesions typical of trachoma. There was less follicular conjunctivitis in the older people, 11% of the 16-49 age group and 8% of those age over 50 being affected, but a greater percentage of these lesions were noted as trachoma. No conjunctival scrapings or other specialized techniques were used for differentiation between trachoma and other causes of follicular conjunctivitis. With the exception of early cases, the lesions noted as trachoma usually had the following features:

1. A thickened upper tarsal conjunctiva,
2. Follicles 1-3 mm in diameter,

3. A vascularized pannus extending down over the upper cornea, and:

4. Scarring of the lid or cornea.

Only one case of trichiasis was seen, but many white, scarred upper lid conjunctivae were seen without entropion.

Tetracycline ointment was prescribed for follicular or purulent conjunctivitis. In the case of children the parents were shown how to instil the ointment, which they did three times daily until the tube was finished. When in the vicinity of a school or a clinic, the head-master or nurse would be asked to supervise the treatment of the children under their care.

External lid infections were uncommon, and more usually seen in young children. Acute purulent conjunctivitis, with typical features, was often seen, and 14% of the children aged under 5 were affected. Many people, mainly middle-aged women, were found to have painful, inflamed eyes of uncertain aetiology. 25% of the 16–49 age-group had this non-specific conjunctivitis. They complained of mild grittiness and some photophobia, but there were no other features.

A condition was noticed in younger patients, which I have called sclerosed conjunctiva, in which the conjunctiva had become thickened and pigmented within the limits of the palpebral fissures. 15% of the children aged 6–15 had this condition which was totally absent in people over 50, and it is possible that it is the precursor of pterygia and pingueculae in older patients. Many patients over 45 had well developed pterygia and often pingueculae too (11% of those under 50 and 66% of those over 50 had one or both of these lesions), but in no case was vision affected.

Cataract was common, and 20% of the patients over 50 had moderate to severe cataracts. All patients were asked if their eyes troubled them, but often there were a combination of defects in symptomless eyes. Foreign bodies, usually seeds or stones, were very common, and patients were generally unaware of their presence.

The object of the eye examinations was to assess the incidence of eye disease and also to find treatable conditions; emphasis was therefore placed on history and external examination. An inaccurate assessment is probably presented of the incidence of retinopathies, uveitis, glaucoma, and refractive errors, since fundal examination was carried out under poor conditions and usually in the older patients who often had some degree of cataract; the intra-ocular tension was assessed only digitally; and refractive errors were not specifically tested for if patients did not complain of poor vision and could read a number plate at 25 yards.

Case reports of special interest

1. A girl of ten had a seed deeply impacted into the right cornea.

It had been there for 3 days and was causing an active keratitis. The seed could not be moved, and the case was referred to Harare Hospital under the temporary treatment of tetracycline eye ointment, atropine drops and an eye pad.

2. A boy of 10 had an eyelash growing from within the lower fornix of the right eye. The eyelash was white but had a true hair follicle. It caused no irritation but was removed.

3. In four patients, a male aged 9 and three females aged 8, 13 and 40, a tarry-black area of conjunctiva was seen on the inner aspect of the upper eyelid. The lesion was always unilateral and usually contained one or more punctae. The areas affected were irregular in shape and size, the patients were unaware of them, and there was no other feature on examination.

4. Two dislocated and opaque lenses were seen in old men, the other eye in each case being normal. It was difficult to say whether the cataract had appeared before or after the avulsion. There was no history of trauma.

5. One other interesting case was that of an elderly man who had one fixed, dilated pupil, and whose sight in that eye was sufficient only to count fingers at 3 yards. He said that a snake had spat in his eye 10 years previously and he had not seen well since.

General examination

Many patients, especially the children, were in a poor state of nutrition, and often were vitamin deficient. Those deficient of vitamin A complained that they could not see in the dark, and had rough, dry skin over the upper part of the outside of the arms. Some had xerosis of the conjunctiva and corneal ulceration in association with this. Cases of pellagra were seen in which there were dry areas of desquamation of exposed skin, deeply pigmented. All these patients had diarrhoea. Two-thirds of the cases were associated with kwashiorkor.

Several cases of infantile scurvy were seen, with dark gum haemorrhages, and often scurvy beading of the ribs, although it is difficult to say whether this feature was due to scurvy alone. Eight cases of rickets were seen. The younger children with this condition had large heads, bow legs, curved forearms and beading of the costo-chondral junctions. Forty-one cases of kwashiorkor, with light-coloured skin often in patchy areas, and sparse silky hair were seen. The extremities were cold and grossly oedematous. The findings are summarized in Table 2.

Eye complaints were found more commonly in the dirty, unkempt and malnourished child, although

TABLE 2.

Condition	Aged 0-5	Aged 6-15	Aged 16-49	Aged 50+	Total
Vitamin A deficient	8	18	2	—	28
Associated xerophthalmia and keratomalacia	4	6	—	—	10
Associated kwashiorkor	4	5	—	—	9
Pellagra	—	13	12	2	27
Scurvy	6	16	4	—	26
Rickets	6	2	—	—	8
Total cases of kwashiorkor	34	7	—	—	41
Generally malnourished	320 (49%)	560 (23%)	233 (31%)	74 (41%)	1187 (29%)
Malnourished patients with eye disorders	89%	54%	63%	92%	

in the older age groups malnutrition was not found to be associated with a significant increase in the incidence of eye disorders.

One case seen was thought to be Wernicke's encephalopathy; a 4-year-old male who was severely ataxic and spasmodically atonic. He had a convergent and inferiorly deviated squint, and could not speak, sit or stand. He was apparently a perfectly normal child until 2 years previous to this examination.

Parasitic infections were common, and in some areas nearly every child had ring-worm or scabies or both. The existence of internal parasites was not investigated. Many cases of ear disease were found, usually corresponding to the state of cleanliness of the patient.

Eight cases of diffuse colloid goitre were seen in middle-aged women. There was no distribution pattern. Since they all ate iodized salt they were probably not iodine deficient, and they were warned against eating an excess of the rape plant. (This is a member of the *Brassica* family, which contain substances such as thiocyanates and thio-oxalidone in their leaves. The rape is a hardy and popular plant in this area where its leaves form a regular part of the diet.)

Other conditions common in the area are malaria, trypanosomiasis, schistosomiasis and sickle-cell anaemia, but it was not possible to discover the incidence of these conditions since there were no facilities for examining the blood or, for example, palpating every abdomen for splenomegaly.

Discussion

Over 60% of all the eyes seen contained some pathology, and in the remoter areas the figure was greater, especially as regards the infective disorders. There is little doubt that this is due largely to the low standard of hygiene, and the fact that the condi-

tions lived in predispose to a wide variety of agents traumatic to the eyes.

Living in an environment of bright light and dust is almost certainly the cause of the very high incidence of pterygia and pinguecula, and the thickened conjunctiva seen in younger patients. The women-folk are almost constantly exposed to smoke from cooking fires, and this probably contributes to the occurrence of the non-specific conjunctivitis seen so frequently in these patients.

Mothers have the unfortunate habit of investigating any eye complaint of their children with dirty, indelicate fingers, or part of their clothing which is invariably filthy. Flies are omnipresent, and all too often seen crawling over a child's eyes. The large number of foreign bodies in the eyes of the children, of which they are unaware, possibly suggests that the eyes become somewhat insensitive after exposure to this sort of trauma.

Of the fifteen cases of unilateral blindness, five were thought to be due to a measles keratitis, seven to actual mechanical trauma, and three admitted to the application of African 'muti' (medicine) when they had had sore eyes. (African muti has a variety of constituents varying from roots and herbs to earth and cow dung. It is often put into the eyes as a remedy for a variety of systemic disorders as well as eye conditions.) Only one of the five totally blind patients admitted to having had muti instilled, but the appearance of all the others suggested that the original situation of traumatic or interstitial keratitis had been aggravated by various noxious substances externally applied.

The stores in all areas were visited, since many patients said that they had bought medicines there. The usual eye medicines stocked were 'Golden Eye Ointment' (containing 1% yellow mercuric oxide) or penicillin eye ointment, both selling for 1/- a tube. The store owners were asked to send people

with sore eyes to the local health assistant who would treat them without charge. Witch-doctors still have a considerable influence in the area, although this is now waning under the presence of trained local medical staff such as the health assistants.

A large amount of follicular conjunctivitis was seen, presenting with conjunctival inflammation, hyperaemia, lacrimation, discharge, and follicles seen mainly on the upper palpebral conjunctiva. The cases of trachoma were distinguished only clinically from chronic follicular conjunctivitis and cases such as inclusion blennorrhoea of the new-born and miliary follicular conjunctivitis. The classical picture of allergic conjunctivitis was rarely seen. It is strange that only one case of trichiasis was seen, since trichiasis and subsequent corneal damage is so frequently a sequel of untreated trachoma. All cases of follicular conjunctivitis were put on to a 3-week course of tetracycline, although no specialized techniques were used to determine the cause.

Senile cataract was common in patients over 50, and it was rare to find a person over 60 without some degree of cataract. The patients who were almost blind were put down for operation, and the others were asked to report to their nearest clinic or health assistant when they began to have trouble in finding their way around. Cataract in the African begins at a much earlier age than in the European, and is so common in the elderly it could almost be regarded as physiological. The eight cases of advanced cataract (bilateral, with perception of light only) were a satisfactory finding. The primitive African accepts adversity philosophically, and once blind merely sits in the sun for the rest of his life. He is a drain on his family and is often meagrely fed. Successful cataract operations can make these people useful and happy members of society once again.

The case of the man who had a fixed, dilated pupil with poor sight in that eye ever since (according to him) a snake spat in it is interesting, but the aetiology is probably not that of snake poisoning. The snake would probably have been the common African or black-necked spitting cobra (*Naja nigricollis nigricollis*) which is distributed throughout the area. The effect of the poison on entering the eyes is instantaneous, causing intense smarting and inflammation, and it can in fact cause blindness if not soon washed out with a bland solution. The venom is predominantly neurotoxic, although it

does contain an haemotoxic element, and acts systemically after being absorbed by the capillary net-work on the surface of the eye. The neurotoxic element is predominantly parasympathetic, and thus the patient will show pupillary constriction, as well as other systemic reactions. Since the pupil in this case was fixed and dilated, it is more likely that the condition followed some other trauma and was attributed to the snake because of such an event being seen or described at the time. Blindness following venom in the eye is usually due to corneal scarring.

Conclusion

The major factor in the aetiology of the eye conditions seen was infection, and this was probably due to the primitive and unhygienic behaviour and living conditions of the population studied. A gradual process of education in cleanliness and health, as was carried out on this exercise, is probably a positive step in helping to prevent this.

Trachoma was found to be extremely common, especially amongst children. Because of the relative scarcity of the condition in adults, and the apparent absence of the serious sequelae of trachoma, it could be postulated that the infection has been recently introduced to the area or is undergoing an exacerbation at the present time. The medical staff in the area should keep a close watch for trachoma, especially in the schools, and treat it as soon as it is found.

Most elderly Africans seen had some degree of senile cataract. Successful cataract operations followed by the return of the elderly patient to his home will be a considerable encouragement for the rural African to seek medical advice rather than the attentions of the witch-doctor. Every effort should be made to find the many old, blind Africans in the bush all over the country, many of whom could be helped.

Acknowledgments

I wish to thank the Secretary for Health (Rhodesia) for permission to present this paper; the Provincial Medical Officer of Health (Mashonaland) for making the survey possible; the District Commissioner and Health Assistants of the Mrewa Trust Lands for their help; Dr A. R. Adamson, M.A., M.R.C.P., Mr J. C. Dean Hart, B.Sc., F.R.C.S., and Dr J. O. M. C. Craig, F.R.C.S.I., D.M.R.D., F.F.R., for their invaluable criticism and advice.