Ocular injuries in Malawi

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SUMMARY A survey was made of 205 patients admitted to hospital for ocular trauma in Malawi in south-east Africa from January 1976 to December 1977. Results of the survey show that eye trauma is a relatively common problem in this developing country, occurring most frequently in children, young adults, and males. Most eye injuries in Malawi occurred under domestic circumstances; the major cause of ocular trauma was associated with chopping and gathering wood. Industrial injuries were rare. The most common injury was contusion and the most frequent complication was traumatic cataract. Most treated eyes retained useful vision.

Few general surveys of ocular trauma appear in the ophthalmic literature.¹⁻⁴ Most deal with penetrating injuries only,⁵⁻⁹ childhood,⁹⁻¹² or adult¹³ eye trauma, or injuries characteristic of a particular environment.^{14,15} All of these surveys were carried out in developed industrial nations. Since many eye injuries are related to particular occupations and cultures, the types of injuries in developing countries are not necessarily similar.

Malawi, in south-east Africa, is a developing country with a population of about 5 million people, of which approximately 80% live in rural areas and engage in agriculture. Medical services in Malawi are free, including transportation to hospitals, but there is a considerable shortage of physicians, particularly specialists. Until the end of 1977 the central hospital in Blantyre was the only place in the country that had an ophthalmology department. All persons seeking treatment for severe ocular conditions were referred to this hospital for evaluation and treatment. We conducted a survey on eye injuries treated there during 1976 and 1977 and report the findings of our survey.

From January 1976 to December 1977 205 persons were admitted to Queen Elizabeth Hospital, Blantyre, for ocular injuries. Eight persons had bilateral injuries. Minor injuries such as conjunctival and corneal foreign bodies which could be treated on an outpatient basis were excluded from the study. All

other cases were included and their records reviewed as for aetiology, time, type of injury, the treatment given, and its results.

Results and discussion

The average delay between occurrence of the injury and admission to the hospital was 10 days, with a range of 6 hours to 32 days. Many patients first resorted to folk medicine, reporting to the hospital only after such traditional methods failed and pain became intractable.

Patients ranged in age from 7 months to 68 years. Age and sex distribution are shown in Table 1. Table 2 compares the age distribution of patients in Malawi with that of patients in other surveys.

Table 1 Age and sex distribution of patients treated for eye injuries

Age	No. of patients	Male	Female	Sex (ratio) M:F
0-10	38 (18.5%)	27	11	2.5:1
11-20	33 (16.1%)	26	7	3.7:1
21-30	43 (21.0%)	32	11	2.9:1
31-40	34 (16.6%)	30	4	7.5:1
41-50	19 (9.3%)	14	5	2.8:1
Over 51	38 (18.5%)	29	9	3.2:1
Total	205 (100%)	158	47	3.4:1*

* Average.

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Table 2 *Geographical comparison of eye injuries by patients' ages*

	Age						Sex ratio M:F
	0-10	11-20	21-30	31-40	41-50	Over 50	
Malawi (1976-7)	38 (18.5%)	33 (16.1%)	43 (21.0%)	34 (16.6%)	19 (9.3%)	38 (18.5%)	3.4:1
Arkansas ² (1937-54)	363 (21.1%)	306 (17.7%)	204 (11.9%)	178 (10.4%)	194 (11.4%)	469 (27.5%)	3.8:1
Iceland ³ (1965-76)	31 (29.5%)	24 (22.9%)	20 (19.9%)	12 (11.4%)	12 (11.4%)	6 (5.7%)	8.5:1
New Jersey ^{4*} (1969-72)	146 (31.2%)	86 (18.4%)	71 (15.2%)	90 (19.2%)+	—	75 (16.0%)	3.0:1

* Age groups reported as 0-9, 10-19, etc.

+ Ages 31-50.

AETIOLOGY AND CAUSATIVE AGENTS

Analysis of the causes of trauma shows that more than half of the injuries were sustained at home or were associated with domestic pursuits (Table 3). 21% of the eye injuries were incurred in fights. Only 6.3% resulted from industrial accidents. As expected, few injuries were caused by traffic accidents, including bicycling accidents. A surprising finding is that only 1.5% of the injuries were related to agriculture, although 80% of Malawi's working population engage in agriculture. This finding may be attributable to the low level of farm mechanisation in Malawi and to the fact that eye injuries occurring in the fields often are not serious enough to warrant admission to hospital. In contrast, Ireland, a developed agricultural country, reported a high number of serious eye injuries incurred during agricultural pursuits.¹⁵

Reports from developed countries indicate that most injuries occurred during sports,² including

children's play.⁷ A 1923 survey from Scotland indicated that approximately 70% of the injuries were industrial in origin and that violence accounted for almost two-thirds of nonoccupational injuries.

The most common single cause of ocular trauma in Malawi was wood chopping, undoubtedly because wood is almost the sole source of energy in its villages, and because of poor safety practices employed in chopping and gathering wood. Blows and falls, followed by injuries from sharp instruments, were the leading causes of eye injuries in other surveys.^{1,2}

EYE INJURIES IN CHILDREN

As in other surveys children and young adults in our study constituted a sizeable proportion of patients with eye injuries. Nevertheless the percentage of eye injuries in persons under 20 was smaller in Malawi than in Arkansas (38.8%),² New Jersey (49.6%),⁴ or Iceland (52.4%).³ A possible explanation is the unavailability of potentially hazardous toys in Malawi as compared with developed nations. Indeed most eye injuries among children in Malawi occurred during domestic activities rather than play (Table 4), whereas games and sports accounted for most of the trauma for this age group in other surveys.

Table 3 *Causes of eye injuries*

Cause of injury	No. of cases	No. of males	No. of females
Domestic			
Chopping wood	52 (25.4%)	39	13
Blunt instruments	17 (8.3%)	14	3
Sharp instruments	14 (6.8%)	11	3
Falls	7 (3.4%)	4	3
Burns (thermal)	2 (1.0%)	2	0
Other	23 (11.2%)	19	4
Total domestic	115 (56.1%)	89	26
Fights	43 (21.0%)	31	12
Industrial			
Blunt instruments	5 (2.4%)	5	0
Glass, earthenware	3 (1.5%)	3	0
Sharp instruments	1 (0.5%)	1	0
Burns (lye)	1 (0.5%)	1	0
Not recorded	3 (1.5%)	3	0
Total industrial	13 (6.3%)	13	0
Road accidents	12 (5.9%)	10	2
Agriculture	3 (1.5%)	2	1
Not recorded	19 (9.3%)	13	6

Table 4 *Causes of eye injuries in patients under 20 years of age*

Cause of injury	No. of cases
Chopping wood	18 (25.4%)
Blunt instruments	11 (15.5%)
Sharp instruments	7 (9.9%)
Fights	7 (9.9%)
Road accidents	3 (4.2%)
Industrial accidents	3 (4.2%)
Burns	2 (2.8%)
Falls	2 (2.8%)
Sports accidents	2 (2.8%)
Others	11 (15.5%)
Not recorded	4 (5.6%)
Total	71

Table 5 *Type of injury*

Type of injury	No. of cases
Contusion	85 (41.5%)
Penetrating injury	68 (33.2%)
Lid injury only	30 (14.6%)
Corneal erosion and foreign body	19 (9.3%)
Burns	3 (1.5%)

TYPES OF INJURIES

Contusions with severe intra- and extraocular complications constituted the greatest number of injuries in Malawi (Table 5). Two of the 3 burn cases were in epileptic children who fell into an open fire during a seizure. Contusions also comprised a high percentage of ocular trauma in industrial countries.⁴ The relatively fewer penetrating injuries in developed countries were probably attributable to the better safety practices observed in those countries. The incidence of penetrating injuries in Malawi is similar to that reported in Scotland in the early 1900s.¹ Lack of education and inadequate safety practices may be common denominators.

OCULAR DIAGNOSIS

The main diagnoses made on the 205 patients are listed in Table 6. When more than one type of major lesion existed in one eye, both are listed. Eight

Table 6 *Diagnosis of ocular injuries*

<i>Site of injury</i>	<i>Total no. eyes</i>		<i>No. of injured eyes</i>
Cornea	65	Perforation with iris prolapse	39
		Severe erosion	17*
		Perforation without iris prolapse	9
Lens	65	Traumatic cataract	55
		Luxation, subluxation	10
Anterior chamber	32	Hyphaema	32
Eyelids	32	Laceration	32†
Orbit	23	Haematoma	19
		Cellulitis	4
Sclera	25	Perforation	32‡
Vitreous	10	Haemorrhage	10
Conjunctiva	8	Severe haemorrhage	8
Retina	4	Haemorrhage and oedema	3
		Detachment	1
		Iridodysplasia	4
Iris	4	Choroidal tear	2§
Choroid	2		
Endophthalmitis on admission	11		
Secondary glaucoma	5		

*Eight with corneal foreign bodies.

†Two with canaliculal involvement.

‡Twenty with corneal perforation.

§Without other ocular pathology.

patients had bilateral injuries: 4 of the 8 had blunt trauma resulting in cataracts in 2 instances and retinal oedema in 2; 4 patients had corneal erosions.

Late arrival at the hospital and delayed treatment resulting from attempts at employing native medicine accounted for the 11 cases of endophthalmitis and 4 cases of orbital cellulitis in addition to primary trauma diagnosed on admission.

We saw no cases of retained intraocular foreign body and no orbital wall fractures, though we looked for these conditions in all patients who had relevant history and clinical findings. Scleral wounds in our series were more common than in others,^{3,4-14} probably because in a less mechanised society eye injuries typically are caused by large, low-velocity objects rather than small, high-velocity objects that tend to produce corneal perforations and retained foreign bodies.

We saw only one case of retinal detachment, attesting to the fact that idiopathic retinal detachment is rare among blacks and that traumatic detachments are rarely seen.¹⁶⁻¹⁷

TREATMENT

Patients with nonpenetrating injuries of the eyeball were treated medically. Surgery was performed only to remove cataracts or for washout of nonresorbed hyphaemas. None of the 32 cases of hyphaema required enucleation of the eyes.

We performed surgery on patients with penetrating eye injuries on admission, repositioning the prolapsed iris as necessary, removing damaged lenses, and suturing lacerations. Vitrectomy, which in some instances might have improved the prognosis, could not be performed because of lack of appropriate instruments.

Other operations performed included repair of eyelids and canaliculi and removal of deep-seated corneal foreign bodies.

Twenty-seven eyes were blind and painful and considered to be beyond repair; 10 of the 27 were enucleated and 17 eviscerated. Eyes that were severely disorganised, with no chance of achieving any degree of visual acuity in patients unlikely to return for follow-up examinations, were enucleated because of risk of sympathetic ophthalmia. One patient admitted for treatment of orbital haemorrhage died as a result of fracture of the base of the skull.

RESULTS OF TREATMENT

Best corrected visual acuity of the injured eyes, recorded from one to 6 months after admission, is shown in Table 7. The 101 patients with resulting visual acuity of 6/12 or better in the injured eye included those with eyelid and orbital injuries, superficial corneal and conjunctival injuries, and a few who

Table 7 Visual acuity following treatment

Visual acuity	No. of eyes
6/6-6/12	101 (47.6%)
6/15-6/20	17 (8.1%)
6/120-finger count	14 (6.6%)
Light perception only	18 (8.5%)
No light perception	31 (14.7%)
Not recorded	30 (14.2%)
Total	211

had corneal and scleral perforations, though most of the latter had a final visual acuity of less than 6/12. The patients with severe penetrating trauma and endophthalmitis, as expected, did rather poorly. Relatively poor results of treatment in this series are due, at least to a certain extent, to the late arrival of these patients for treatment.

Conclusion

Eye trauma occurs fairly frequently in developing countries and constitutes a major health problem. Efforts to prevent ocular injuries should particularly be directed toward improving established domestic habits, such as the methods of chopping and gathering wood. The necessity of seeking professional medical help immediately after injury and the danger of delaying treatment by first resorting to folk medicine should also be stressed. A campaign of this kind, however, is difficult to conduct in a country where schooling is not universal and much of the population has no access to mass media.

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