

# Frequency and causes of ocular trauma among children attending Mulago Hospital Eye Department

John Mayek<sup>a</sup>, Ann M Ampaire<sup>b</sup> and Grace Ssali<sup>c</sup>

<sup>a</sup> Postgraduate student, Makerere University, College Of Health Sciences Department of Ophthalmology

<sup>b</sup> Senior lecturer, Oculoplastic surgeon, Makerere University, College Of Health Sciences Department of Ophthalmology

<sup>c</sup> Senior lecturer, Paediatrics Ophthalmologist, Makerere University, College Of Health Sciences Department of Ophthalmology

Correspondence: John Mayek [kurdaw2020@gmail.com](mailto:kurdaw2020@gmail.com)

**Background:** Ocular trauma is a frequent and avoidable cause of visual impairment. Injuries range from a small corneal epithelial abrasion to penetrating and globe rupture leading to blindness or poor vision. Hospital based studies of eye trauma indicate that about two thirds of those affected are male, predominantly children and young adults with injuries by sticks, stones, and metallic objects being the most.

**Objective:** To examine the frequency, pattern and causes of ocular trauma among children at Mulago hospital using a hospital based descriptive cross-sectional study.

**Results:** Of the 161 children seen with ocular trauma, 45.9% were aged 0-5 years, 32.3% were aged >5-12 years and 21.8% were aged >12-17 years; the male to female ratio was 2.1. Sticks were the commonest agent of injury. The most common places of trauma was in the home and school, and the commonest activity at occurrence of injuries was playing and fighting. Only 2.5% of cases presented to the hospital within 24 hours. About a quarter presented with immediate visual acuity better than 6/18, while 19.2% presented with visual acuity worse than 6/18-6/60, and 44% presented with visual acuity worse than 6/60-NPL.

**Conclusion:** The frequency of ocular trauma amongst children attending Mulago Hospital is high, one in every five children seen at the eye clinics had ocular trauma.

**Key words:** *Mulago Hospital, ocular trauma in children, paediatric.*

## Introduction

Ocular trauma is damage to the eye as a result of mechanical, electrical, thermal, or chemical energy [1]. It is a frequent and avoidable cause of visual impairment. Injuries range from a small corneal epithelial abrasion to penetrating and globe rupture.

Over 55 million eye injuries occur each year [2]; 1.6 million people go blind from these injuries, 2.3 million suffer bilateral low vision and 19 million remain with unilateral or low vision.

In sub-Saharan Africa a population based survey of blindness showed that monocular blindness due to trauma ranges from 20–50% [2]. In a few surveys trauma was listed as a cause (3.2–5.5%) of bilateral blindness [3]. Hospital based studies of eye trauma indicate that about two thirds of those affected are male, predominantly children and young adults with injuries by sticks, stones, and metallic objects being the most common [4]. Injuries among children are usually accidental and uni-ocular while among adults they are usually the result of intentional assault.

Over the last ten years, the number of children with ocular injuries seen in the Eye Department have increased from 720 in 2013 to 912 in 2014. Many had suffered complete loss of vision in the affected eye and some had disfigurement.

There is no documented study of ocular trauma in children in Uganda. So the aim of this study was to record the frequency, features and causes of ocular trauma in children at Mulago National Referral Hospital Eye Department.

## Method

The study was conducted from August to November 2015. All children aged under 18 years who presented during the study period (and who were conscious, with stable vital signs) were enrolled with appropriate consent until the required sample size (using the Kish and Leslie formula) was attained

All children were tested for visual acuity, had a detailed history taken and physical and ocular examinations.

Data were handled using EpiData. Analysis was mainly

**Table 1. Socio- demographic characteristics**

Socio-demographic variable	n	%
<b>Age - years</b>		
0-5	74	45.9
> 5-12	52	32.3
> 12-17	35	21.8
<b>Sex</b>		
Male	103	64.0
Female	58	36.0
<b>Residence</b>		
Urban	54	33.6
Rural	107	66.4
<b>Education</b>		
Pre-school	60	37.2
Primary	63	39.2
Secondary	38	23.6
<b>Ethnicity</b>		
Bantu	147	91.3
Non Bantu	14	8.7
<b>Religion</b>		
Christian	126	78.2
Muslim	35	21.8

descriptive using the stata version 12 program. Permission was obtained from the Department of Ophthalmology, School of Medicine Research and Ethics committee, Makerere University College of Health Sciences. Consent was obtained from participating children aged above 15 years and from parents/ guardians of younger children.

## Results

### Socio- demographic characteristics

Out of 743 children examined, 161 had ocular trauma of which 42 were old cases being followed up. Table 1 shows the number in each age, sex and education group. The majority resided in rural areas, were in the Bantu ethnic group and were Christians. Children aged 0-5 years were most commonly affected, and there were more males than females in all age groups.

### Details of Trauma

Table 2 shows that:

- Trauma usually affected only one eye
- More than half of the injuries occurred at home followed by a third at school
- Most children were injured during play while less than 10% were due to a road traffic accident (RTA), assault or fighting

**Table 2. Clinical history of the study population (n = 161)**

Factor Variable	Category	n	%
<b>Injured Eye</b>	Unilateral	155	96.2
	Bilateral	6	3.8
<b>Location at time of injury</b>	Home	90	55.9
	School	57	35.4
	On the road	10	6.3
	Playground	4	2.4
<b>Circumstance</b>	Play	126	78
	Road traffic accidents	13	8.0
	Assault	13	8.0
	Fighting	8	5.0
	Others	1	0.7
	Within 24 hours	4	2.5
<b>Time between injury and report for medical attention</b>	72-24 hours	27	16.7
	72 hours - one week	89	55.2
	More than one week	39	24.3
	Undetermined	2	1.3

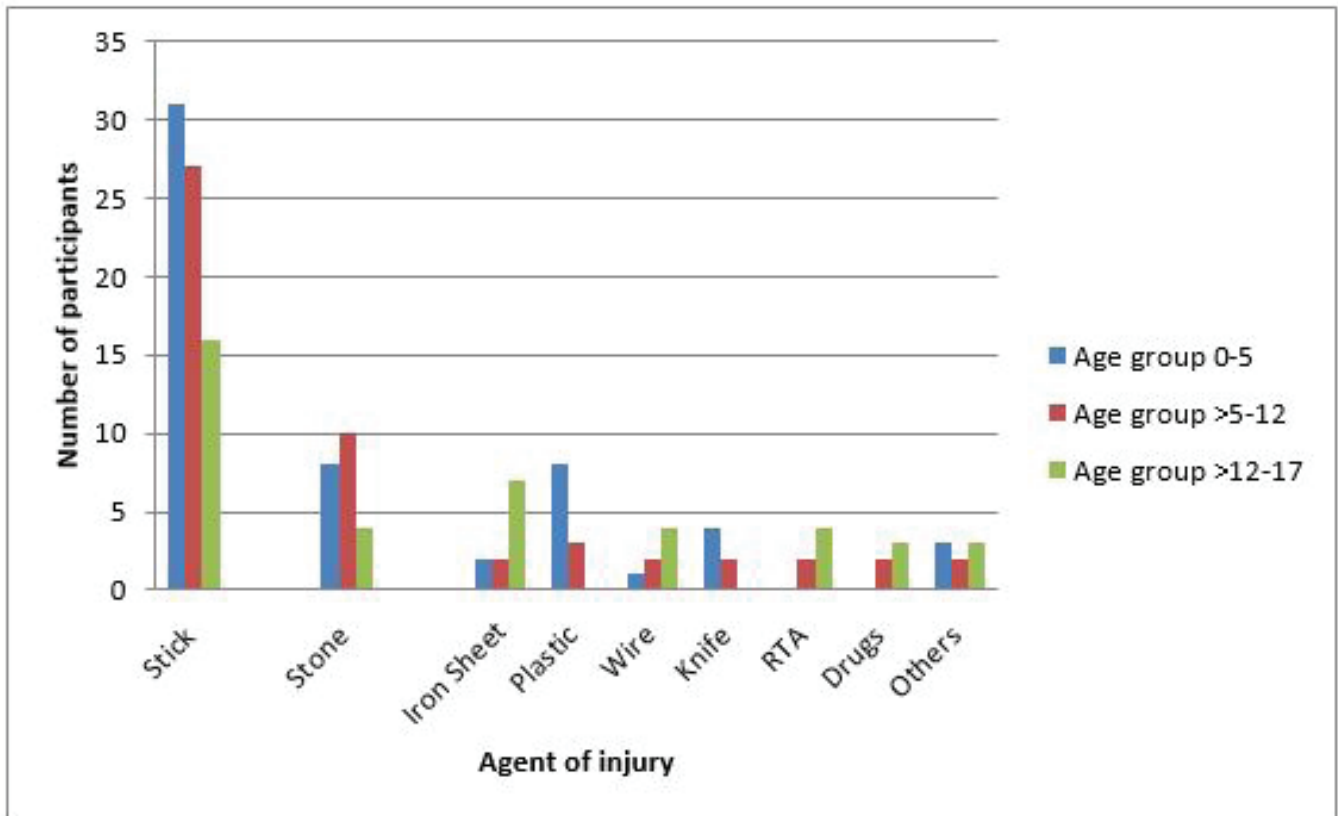


Figure 1. Distribution of agent causing injury by age group

- Very few presented to the hospital within 24 hours of time of the injury

About a quarter of children presented with immediate visual acuity better than 6/18, while 19.2% presented with visual acuity worse than 6/18-6/60, and 44% presented with visual acuity worse than 6/60-NPL.

**Types of eye injuries sustained by the 161 children**

Corneal laceration was the most common injury (47.8%) followed by traumatic infected corneal ulcers (13.4%), lid laceration (7.4%), traumatic cataract (5.5%), traumatic hyphema (5.5%), traumatic endophthalmitis (4.9%), corneal abrasion (4.3%), superficial foreign body (3.1%), traumatic corneal scars (3.1%) and others (4.9%). One hundred and twenty-two ultrasound scans were done on 122 children showed 108 were normal, 10 had traumatic cataract, and 2 each had retinal detachment or vitreous haemorrhage. Two brain CT scans were done: one was normal and the other showed brain oedema.

Figure 1 shows most injuries were caused by sticks or stones. For home-related injuries, wire and knives were mainly involved. Males were more affected than females with all agents except for wire and knives. Females were not affected by drugs.

**Treatment of ‘old’ cases**

Table 3 shows that 23.9% of the 42 children were

managed conservatively with eye drops, ointments and systemic antibiotics, and 76.1% had surgical repair and antibiotic cover. The time between admission and surgical operation ranged from within five days (56.2%) and over ten days (22.0%). The length of stay in hospital ranged from 0 – 5 days (77.7%) to over 16 days (2.7%).

**Discussion**

In our study the frequency of ocular trauma (21.6%) was a less common presentation to other presenting conditions in children such as squint/ red eye compared to some other investigations [5]

Only 2.5% of the patients presented within the first 24 hours of injury, 55.2% presented within one week, and 16.8% presented after more than one week. It has been reported that patients in the lower socioeconomic levels delayed presentation for longer than in those in higher socioeconomic levels, regardless of whether the injury was mild or severe.

Forty-four per cent of children presented with an initial visual acuity of <6/60- non-perception of light of the involved eye: most had open globe injuries. A Kenyan study [5] found that 70% of patients had open globe injuries and 77% presented with an initial visual acuity worse than 6/60. In our study we found that play accounted for the majority of ocular trauma cases, because children during play are vulnerable - with males in all age

Table 3. Details of 42 'old' cases

Factor Variable	Category	n	%
Injured Eye	Surgical	32	76.1
	Medical	10	23.9
Time between admission and surgical operation (n=32)	0-5 days	18	56.2
	6-10 days	7	21.8
	11-15 days	4	12.5
	16 days and more	1	3.2
	Undetermined	2	6.3
Hospitalization period (n=42)	0-5 days	28	77.7
	6-10 days	3	8.3
	11-15 days	2	5.5
	16 days	1	2.7
	Undetermined	2	5.5

group being most affected. Sticks and stones were most commonly involved and this reflects the same experience reported from Kenya [5]. The incidence of injuries in the home in this study (55.9%) is significantly higher than a study in Egypt [6], where the frequency of ocular trauma occurring at home was 45.6%.

In this study there were more males than females - similar to that reported in Nigeria [7, 8] and may be attributed to the greater tendency for males to be involved in injury-prone contact sports and recreational activities.

### Conclusion

One in every five children that present to the eye department at Mulago, do so as a result of ocular trauma and 44% of these patients have poor vision in the affected eye. As most of these accidents occur when playing in the home or at school and only 2.5% of patients attend eye clinic within 24 hours there is a need to educate parents and teachers in prevention strategies and encourage early presentation to an eye clinic.

### Competing interests

There were no competing interests to declare.

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