Epidemiology of Ocular Trauma in a Pediatric Referral Unit, Sao Paulo, Brazil

We performed a retrospective study of hospital records of children younger than 14 years with ocular trauma seen at our center in Sao Paulo, Brazil, between 2011 and 2012. From the total number of cases, 224 (89.2%) could be easily avoided. Accidents occurred with 5 children under 1 year of age; with one baby as young as 2 months. Also, there was a higher prevalence of ocular trauma in 2-to-6-year-old male patients, mainly caused by accidents resulting from the patient's own actions and occurred at home, usually in the presence of an adult. The average time (range) between the accident and seeking medical care was 17.4 hours (10 minutes to 14 days). There is a need to educate parents for preventing ocular trauma.

Keywords: *Accident, Blindness, Injury, Outcome, Prevention.*

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Childhood ocular trauma mainly occurs within the family environment and is the major cause of unilateral blindness and amblyopia [1,2]. Two types of ocular trauma are described: open-globe injury (outermost tunica is disrupted) and closed-globe injury (corneoscleral wall of the globe remains intact) [3]. Of the registered OTs, 20-50% occur in children, most of them are male [1,3-5]. The assessment of children involved in accidents should be systematic in order to prevent a vision-threatening pathology from going unnoticed [6]. Epidemiological data on ocular trauma in countries like Brazil are scarce. We herein report on profile of ocular trauma from a single center in Brazil.

A retrospective study was performed by analyzing the medical records of patients under 14 years old presenting to a referral emergency unit (REU) in Sao Paulo, Brazil with ocular trauma between 2011 and 2012.

There were 251 cases (62.6% males) of ocular trauma being the most affected the pre-school (2-6 y) [105 (41.8%)] age (**Table I**). Accidents occurred with 5 children under 1 year of age; with one baby as young as 2 months. From the total number of cases, 224 (89.2%) could be easily avoided being 29% caused by patient (15.4% by super glue; 17% by furniture; 4.6% by wire; and 14% by toys); 22.8% by IFB; 12.9% by physical aggression [mainly, 24.1% by stone throwing; 34.5% by classmates; 27.5% by siblings]; 12.1% by burn; 5.3% by scratch/bite (75% dogs; 25% cats); 4.1% by fall. The average time (range) between the accident and seeking medical care was 17.4 hours (10 minutes to 14 days). An adult was present at the time of the accident in 56.8% of cases, mainly the mother (60.5%).

The most commonly affected age group was preschool children, and thus require more attention from parents and caregivers. We must also take into account that the younger the child, the faster and deeper amblyopia is likely to be, which will eventually lead to visual deprivation [7].

Table I Characteristics of Children With Ocular Trauma Treated at a Referral Emergency Unit, Brazil (*N*=251)

Characteristic	*No (%)*
Age	
Children (≤2 y)	28 (11.2)
Pre-school (2-6 y)	105 (41.8)
School age (7-10 y)	64 (25.5)
Teenagers (11-14 y)	54 (21.5)
Injured eye, n=230	
Right	104 (45.2)
Left	124 (54.0)
Both	2 (0.8)
Type of injury, n=218	
Open globe	18 (8.2)
Closed globe	158 (72.5)
Eyelid	42 (19.3)
Activity during the accident, n=97	
Playing[a]	49 (50.6)
Inappropriate activity[b]	24 (24.7)
Playing with the ball[c]	10 (10.3)
No activities[d]	14 (14.4)
Place of accident, n=133	
At home	99 (74.4)
On the street	25 (18.8)
At school	9 (6.8)
Trauma caused by, n=224	
Intraocular foreign bodies[f]	65 (29.0)
Physical aggression[h]	51 (22.8)
Accident[e]	31 (13.8)
Burn	29 (12.9)
Falls	27 (12.1)
Pets	12 (5.3)
Another person[g]	9 (4.1)
Interval between accident and medical care, n=184	
Less than 1 h	12 (6.5)
From 1 h to 4 h	80 (43.5)
From 5 h to 1 d	54 (29.3)
More than 1d	38 (20.7)

[a]*running, climbing furniture, making and flying a kite, riding a scooter or bike;* [b]*climbing up a bunk bed, playing with alcohol and fire, playing with an iron bar and wooden club, fixing a bicycle, fighting, jumping on the bed, jumping over a bonfire, running with scissors and playing with glue;* [c]*playing volleyball, soccer and basketball;* [d]*sitting, sleeping, crawling, cutting a nail, staying or sitting under a tree and brushing the teeth;* [e]*nail scratching, finger in the eye, hit by stone, hit by a ball, hook, stab, explosive, detergent and toothbrush;* [f]*hit something in the eye or hit an eye on furniture and super glue;* [f]*speck, sand, wood, glass, earth, sparks, dust, wood, marbles and vegetable;* [g]*brother, father or classmates;* [h]*caused by stone, toy, beans, stick and broom.*

A larger proportion of boys could be explained by their propensity for violent/dangerous games, and participation in inappropriate activities. Other authors also report similar sex predilection [8-11]. Most of the traumas were caused by the patients themselves and at home, which could be avoided with supervision of parents and caregivers during their activities. Furthermore, the high number of physical aggression against children reveals a social problem. Most of them occurred among classmates/neighbors (41%) and among siblings (17%).

The average time to seek medical care over 12 hours reveals the population´s lack of knowledge regarding ocular trauma, and this number is likely to decrease if awareness activities are undertaken among the population.

Our results contrast from a demographic data from ocular trauma in Indian children at a tertiary eye care center in central Maharashtra, where the children aged 6–10 years (39.3%) were most commonly affected followed by children from 11 to 15 years (36.1%) [12]. We described a higher number of cases with closed-globe injury contrasting with the Indian children where the most (63.9%) had open-globe injury which required immediate surgical intervention in 92.3% of the cases [12].

A standard protocol for data collection in pediatric ocular trauma epidemiological studies is of utmost importance and should include: incidence, demographic characteristics, causes/ mechanisms, places of the accident and sites of injury, clinical treatment and visual results of injured children [13]. In addition, special attention should be paid to the family environment, where the prevalence of pediatric ocular trauma is high [14].

In the literature, the most common causes of reduced visual acuity after ocular trauma in children are amblyopia and the presence of corneal opacity. The main risk factors associated with this reduction in visual acuity are younger age at the time of the trauma, presence of low initial visual acuity, location of the lesion in zone 3 (posterior region), extent of the lesion, lens involvement, vitreous hemorrhage, retinal displacement and endophthalmitis [15]. Standardized scores to classify ocular trauma in children [16] are available.

As study limitations, the authors were not able to perform a description for visual disability or loss of sight in our patients; also, a follow-up study was not done in our sample and an ocular trauma score was not evaluated.

There was a higher prevalence of trauma in 2-to-6-year-old male patients, mainly caused by accidents resulting from the patient's own actions. Most of the patients treated had closed-globe injuries and the accident occurred at home. In most cases, an adult was present at the time the trauma occurred. Prevention is vital and in order to be effective, needs more awareness activities and structured management.

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RICARDO MENDES PEREIRA,[1] MELANIE BERCHARA PASCHOALATO,[1] ANDRESSA OLIVEIRA PEIXOTO,[1] FERNANDO AUGUSTO LIMA MARSON,[2] ANDREA DE MELO ALEXANDRE FRAGA[1*]

*[1]Department of Pediatrics, School of Medical Sciences, University of Campinas, Tessália Vieira de Camargo, 126, Barão Geraldo, Cidade Universitária Zeferino Vaz, Campinas; [2]Post graduate Program in Health Science, Laboratory of Cell and Molecular Tumor Biology and Bioactive Compounds and Laboratory of Human and Medical Genetics, University of São Francisco, Avenida São Francisco de Assis, 218, Jardim São José, CEP: 12916-900, Bragança Paulista; São Paulo, Brazil. *andreafrag@gmail.com*

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