

Epidemiology of Pediatric (Ages 2-5 Years) Ocular Injuries Presenting to the Emergency Department

Siri Uppuluri, BA; Aditya Uppuluri, MD; Marco A. Zarbin, MD, PhD; Neelakshi Bhagat, MD, MPH
Institute of Ophthalmology and Visual Science, Rutgers New Jersey Medical School, Newark, NJ

Background and Objective

About one-third of eye-related visits to emergency departments each year across the United States occur in the pediatric population.¹ It has also been identified that this same age group is more likely to have a high risk of vision loss with these presenting injuries.¹ The largest volume of pediatric cases at one urban medical center was documented during the spring and early summer when stratified seasonally, and commonly documented types of ocular injuries included open globe injury, eyelid laceration, and orbital floor fracture.² Sporting activities were identified as the most common etiology of injury in this study.² This project seeks to expand upon existing trends documented in the literature by describing the epidemiology of ocular trauma presenting to emergency departments nationally.

Objective: The objective of this project is to use the National Trauma Data Bank (NTDB) to describe the trends in epidemiologic factors and types of ocular injury in children ages 2 to 5 years presenting to the emergency department (ED).

Materials and Methods

The NTDB was utilized to describe trends in the epidemiology of ocular and adnexal trauma in pediatric patients between 2 and 5 years of age. The NTDB reports national information from participating institutions on emergency department visits resulting in admission, mortality during the ED encounter, or transfer to another hospital from 2007 to 2014. Statistical analysis was performed using IBM SPSS 23.

Financial Disclosures

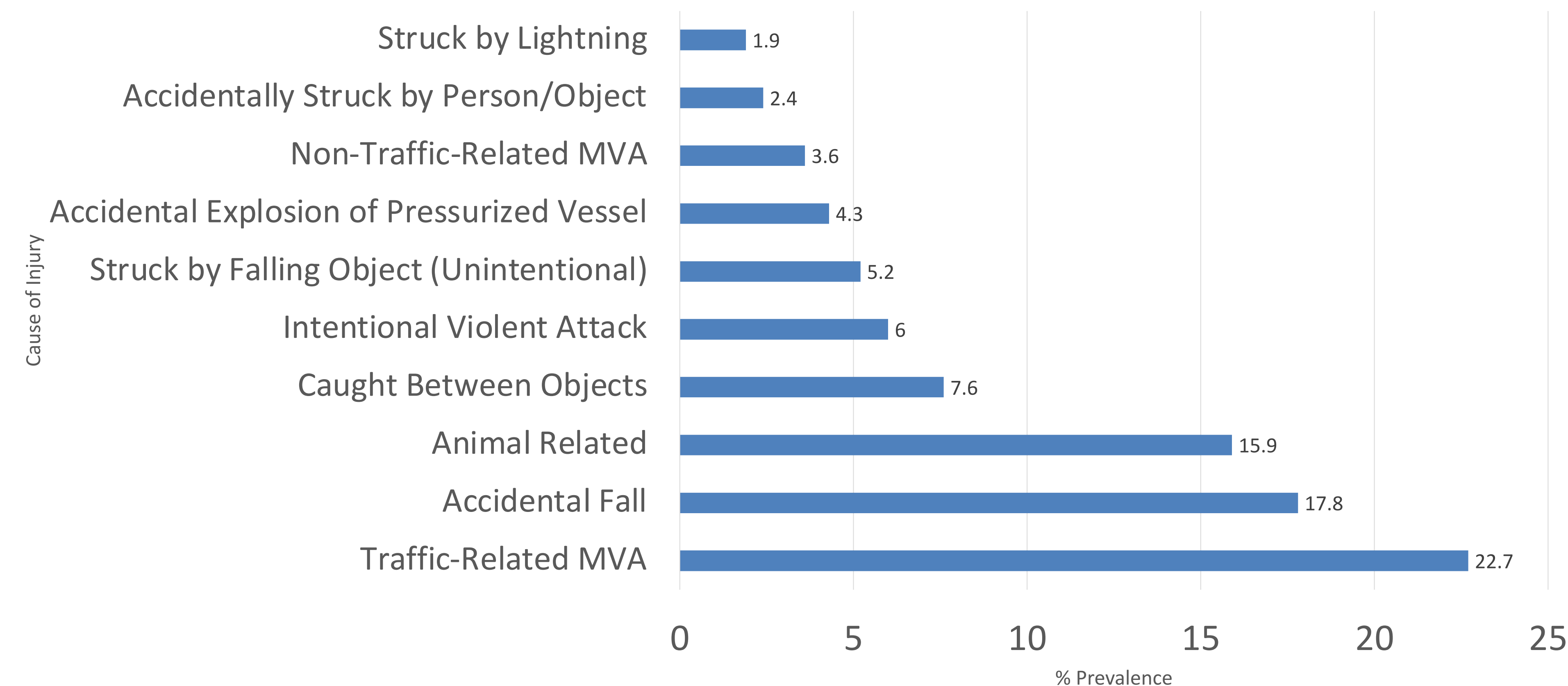
The authors have no financial relationships to disclose. The project was not funded by any external grants.

Results

In total, 9543 cases of ocular or adnexal trauma were identified in patients ages 2 to 5 presenting to the ED between 2007 to 2014. Of these cases, when stratified by gender, race, and presenting hospital type, the plurality occurred in boys (59.8%), Whites (55.3%), and at university-associated hospitals (67.6%). The mean length of stay was 3.82 days, and the mean length of ICU stay, applicable in 2775 cases, was 4.92 days. The most common location of injury was at home (57.9%), and 2.4% of cases resulted in death. The 10 most common causes of injury were traffic-related motor vehicle accident (MVA) (22.7%), accidental fall (17.8%), animal-related (15.9%), caught between objects (7.6%), intentional violent act (6.0%), struck by falling object unintentionally (5.2%), accidental explosion of pressurized vessel (4.3%), non-traffic-related MVA (3.6%), accidentally struck person/object (2.4%), and struck by lightning (1.9%).

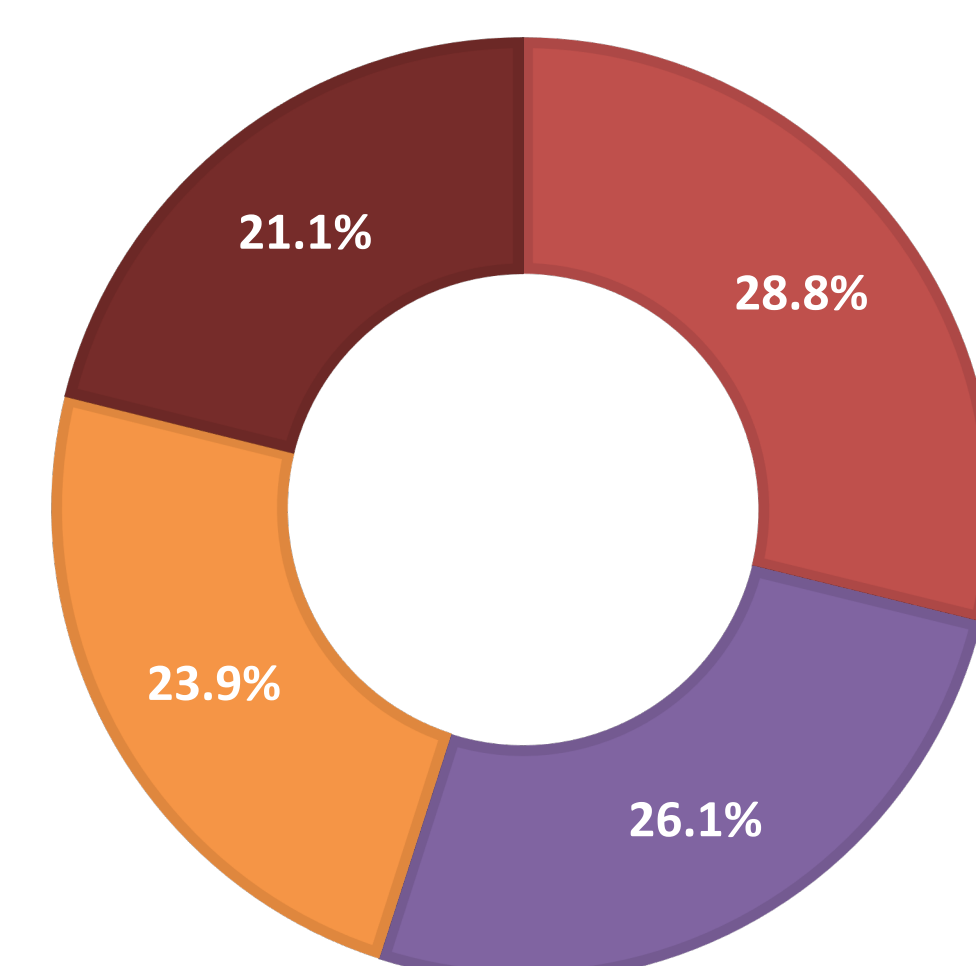
With regard to types of ocular injury, the most common were open wound adnexal injuries (36.7%), orbital floor fracture (17.6%), open globe injury (13.9%), optic pathway/cranial nerve injury (4.2%), and ocular adnexal burns (2.5%). When stratified by age, the 3 most common causes of injury continued to be traffic-related MVA, animal-related, and accidental fall. In addition, by age mortality was highest in 2-year-old patients (4.2%), and decreased with age, being 1.2% in 5-year-olds. Certain types of ocular injury also varied in prevalence by age, with orbital floor fracture increasing in prevalence with age (13.6% in age 2 vs. 22.4% in age 5), and open globe injury increasing in prevalence with age (10.0% in age 2 vs. 17.3% in age 5). There was also a statistically significant difference in prevalence of open globe injury when stratified by gender, occurring in 14.7% of boys and 12.5% of girls ($p = 0.002$).

Most Common Causes of Ocular Injury



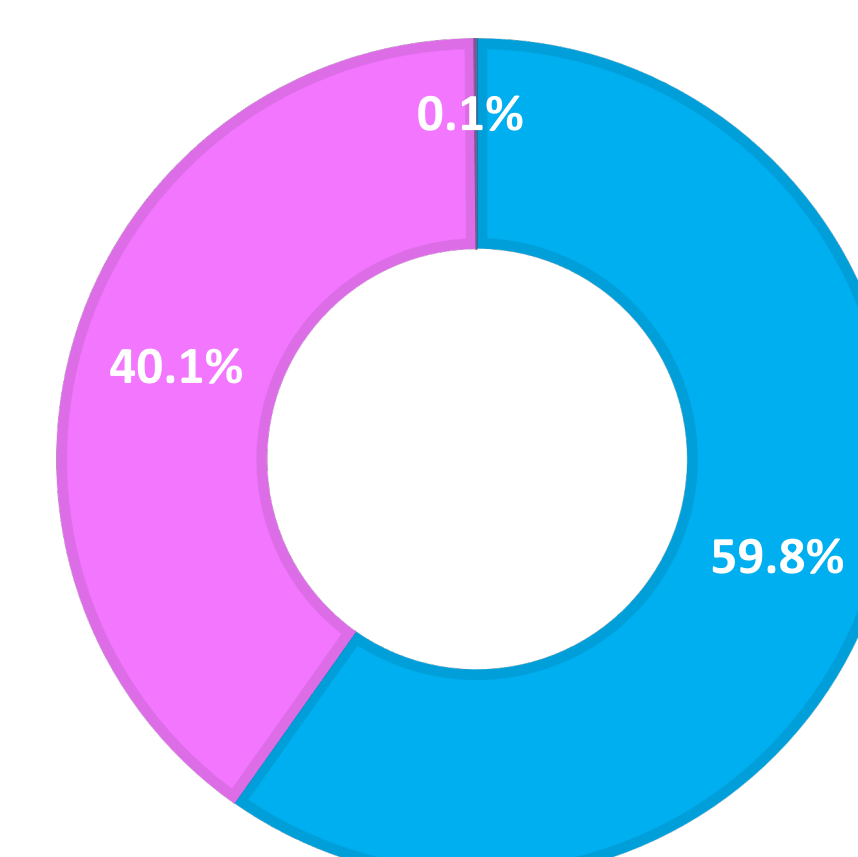
OCULAR INJURY BY AGE

■ 2 years ■ 3 years ■ 4 years ■ 5 years



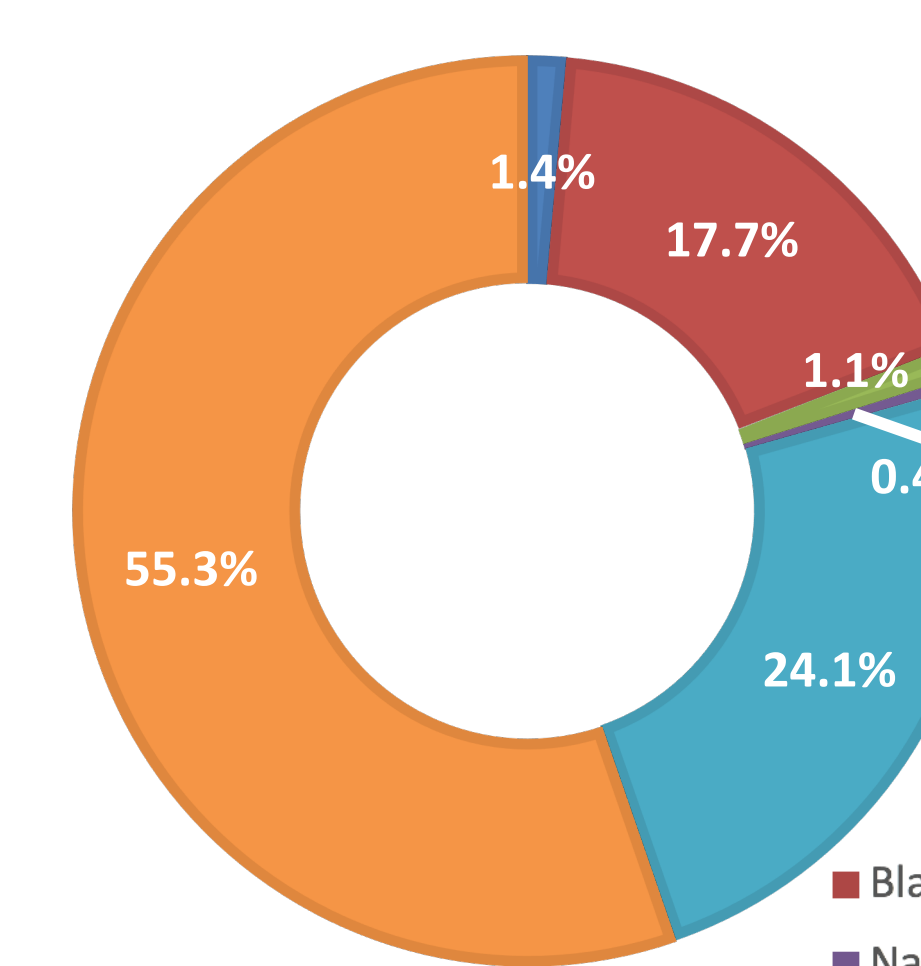
OCULAR INJURY BY GENDER

■ Boys ■ Girls ■ Unknown



OCULAR INJURY BY RACE

■ Asian
■ Native American
■ Other/Not Reported
■ Black
■ Native Hawaiian/Pacific Islander
■ White



Conclusions

In cases of ocular or adnexal trauma occurring in children ages 2 to 5 years, the plurality occurred in boys, Whites, at home, and presented to university-associated hospitals. The most common causes of injury were traffic-related MVA, accidental fall, and animal-related. Prevalence of orbital floor fracture and open globe injury increased with age.

References

1. Matsa E, Shi J, Wheeler KK, McCarthy T, McGregor ML, Leonard JC. Trends in US Emergency Department Visits for Pediatric Acute Ocular Injury. *JAMA Ophthalmol.* 2018;136(8):895–903. doi:10.1001/jamaophthalmol.2018.2062
2. Ramsay C, Murchison AP, Bilyk JR. Pediatric Eye Emergency Department Visits: Retrospective Review and Evaluation. *J Pediatr Ophthalmol Strabismus.* 2021;58(2):84-92. doi:10.3928/01913913-20201118-01

