

Eye Injuries Treated in Rhode Island Hospitals

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Eye injuries are an important cause of visual impairment.¹ The reported population-based rate of the incidence of eye injury varies depending on the data source and on the definition of eye injury. One recent study reports an estimated national rate of eye injuries treated in hospital emergency departments of 3.15 per 1000 population in 2000.²

Information on the incidence of eye injuries among Rhode Island residents comes primarily from the data on **inpatient (IP) discharges** and **emergency department (ED) visits** reported regularly to the Rhode Island Department of Health by the state's acute-care general hospitals since 1989 (IP) and 2005 (ED). Recent analyses of all injury and trauma treated in hospital inpatient settings³ and hospital emergency departments⁴ did not specifically address eye injuries. This analysis presents Rhode Island data on ED patients treated for eye injuries during 2005 and on hospital inpatients treated for eye injuries during the five-year period 2002-2006, aggregated because of small annual numbers.

METHODS

Under licensure regulations, the eleven acute-care general hospitals in Rhode Island have reported to the Department of Health's Center for Health Data and Analysis a defined set of data items on each IP discharge beginning January 1, 1989, and on each ED visit beginning January 1, 2005. The data reported include patient-level demographic and clinical information. This analysis covers IP discharges occurring January 1, 2002 – December 31, 2006, (including admissions from all sources, not just the ED) and ED visits occurring January 1 – December 31, 2005 (including only those ED visits where the patient received treatment in the ED and was not admitted as an inpatient). Due to ongoing investigations into the manner in which hospitals report their utilization data, these data are provisional and subject to change.

Cases of eye injury were identified by searching all twenty-five fields for diagnostic codes provided in hospital IP records and all eleven fields for diagnostic codes provided in records of ED visits. Cases with an eye injury reported anywhere in the record were divided into those with a principal diagnosis of eye injury and those with an additional

diagnosis of eye injury. In the latter group, the principal diagnosis could be either another injury or a condition other than injury.

The included codes and code ranges, from the International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM)⁵, were grouped as follows:

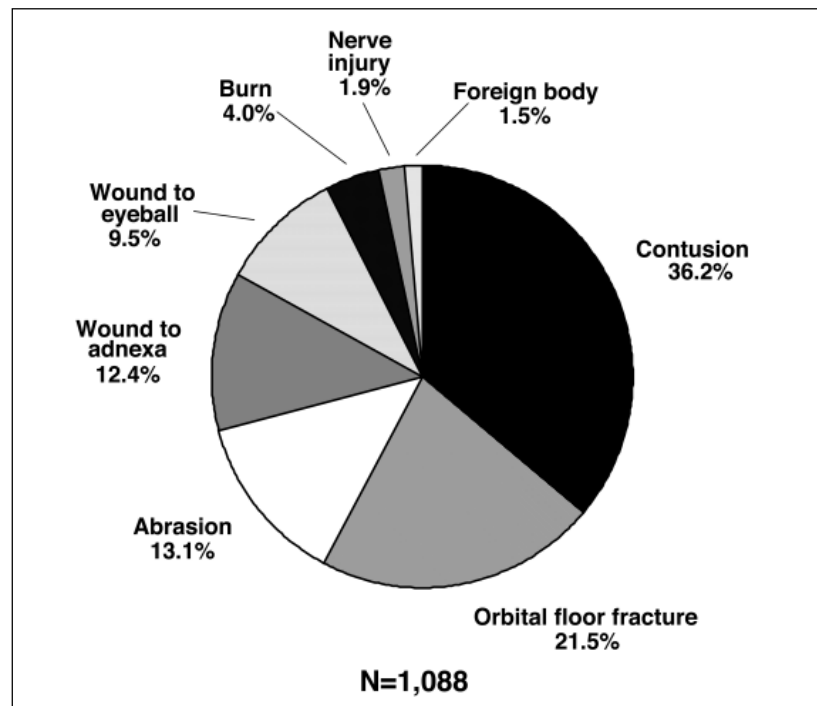


Figure 1. Hospital inpatient discharges with a diagnosis of eye injury, by type of injury, Rhode Island, 2002-2006.

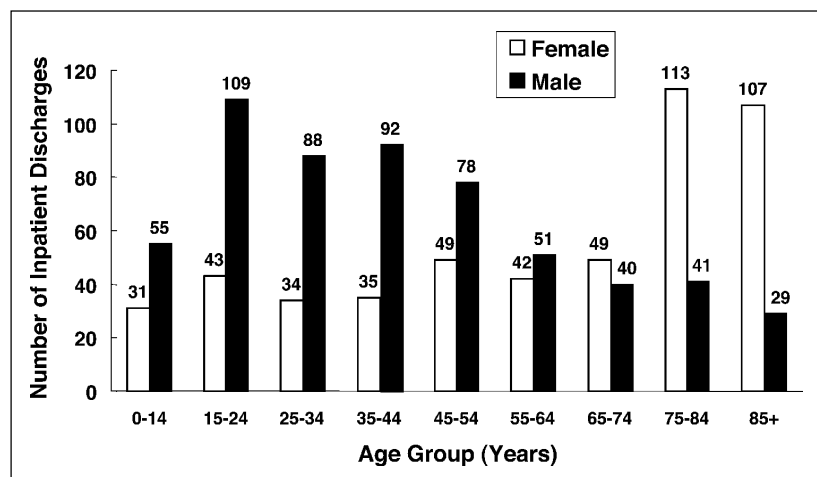


Figure 2. Hospital inpatient discharges with a diagnosis of eye injury, by age group and sex, Rhode Island, 2002-2006

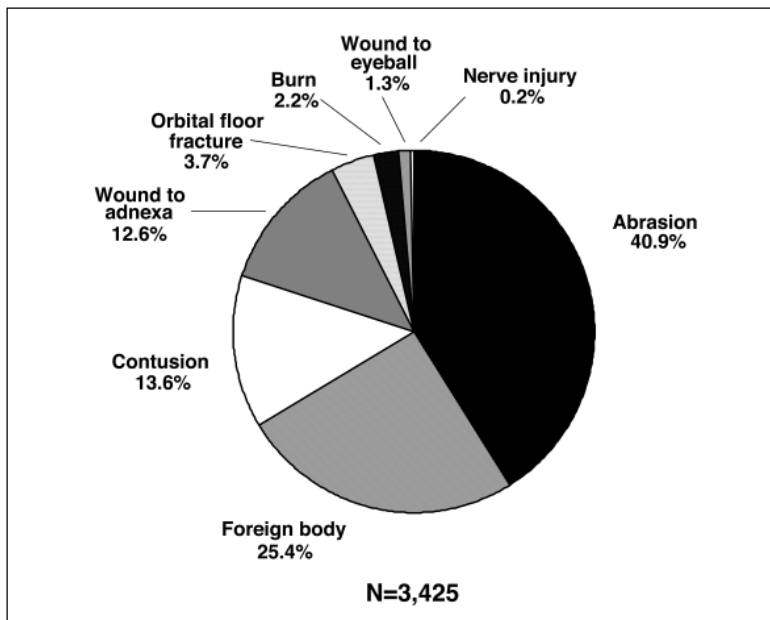


Figure 3. Hospital emergency department visits with a diagnosis of eye injury, by type of injury, Rhode Island, 2005.

- Blowout fracture of the orbital floor [ICD-9-CM 802.6, 802.7]
- Open wound to the adnexa [870]
- Open wound to the eyeball [871]
- Superficial injury (abrasion) to the eyeball and adnexa [918]
- Contusions of the eyeball and adnexa [921]
- Burn of the eye [940; 941 with 5th digit of '2']
- Injury to nerves involved in vision and movement of the eyes [950, 951.0, 951.1, 951.3]
- Foreign body on external eye [930]

Groupings were based on those used in the Barell Injury Diagnosis Matrix⁶ augmented to be comparable with a recent national study.¹ The mechanism and intentionality of eye injuries were examined using the ICD-9-CM external cause of in-

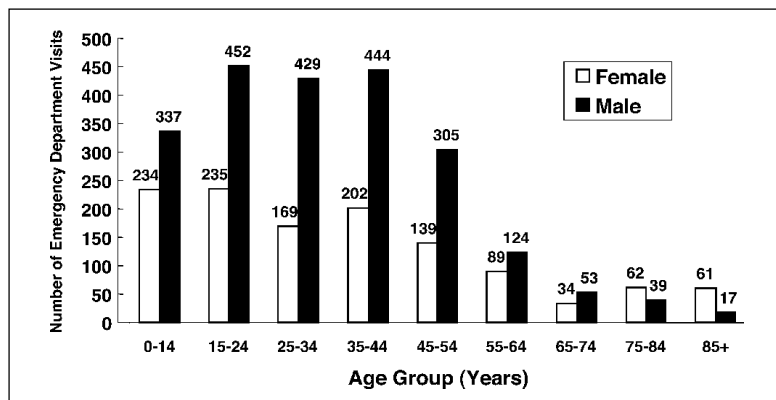


Figure 4. Hospital emergency department visits with a diagnosis of eye injury, by age group and sex, Rhode Island, 2005

jury codes (E-codes) reported in both the IP and ED databases.⁷

RESULTS

In the five-year period 2002-2006 there were 1,088 hospital discharges with either a principal diagnosis or an additional diagnosis for eye injuries. Eye injuries were the principal discharge diagnosis in 200 of these cases. Open wounds to the eyeball were the most often cited (39.5%) as a principal diagnosis, with orbital floor fractures second (29.0%). Among all cases, contusions (36.2%) were the most commonly reported eye-injury diagnoses in inpatient records. (Figure 1)

Eye injuries resulting in an inpatient hospitalization occurred throughout the age span but followed very different patterns by sex. (Figure 2) Males predominated in the age groups through age 54, as is common with injury hospitalizations. Female and male numbers were about equal in the age groups 55-74. In persons 75 years of age and older who were hospitalized with eye injuries, females make up most of the cases (75.9%). The median age among IP hospitalizations was 39 for males and 68 for females.

By mechanism of injury, eye injuries among inpatients were caused primarily by falls (34.6%), motor vehicle crashes (21.6%), and being struck by an object or person (10.6%). Only 5% of hospital IP records reporting eye injuries lacked an external cause of injury code.

There were 3,425 visits to Rhode Island hospital EDs in 2005 with diagnoses of eye injuries. For eye injuries for which medical care in the ED was sought, very few (3.5%) were admitted for an overnight stay in the hospital. (There are no data on how many of these injuries were referred for subsequent inpatient treatment at the same or a different hospital.) Most of the eye injuries seen in the ED were classified as unintentional (85.8%) with a much smaller number due to assault (6.3%). Slightly more ED visits lacked a code for external cause (7.1%) than was true for inpatient discharges.

Among reported ED visits for eye injury in 2005, abrasions (40.9%), foreign bodies on the external eye (25.4%), and contusions (13.6%) predominated. (Figure 3) Open wounds to the adnexa (12.6%) were common but not often admitted, while eye-injury patients with open wounds to the eyeball and blowout fracture of the orbital floor were those most likely to be admitted.

In 2005, males accounted for 64.2% of hospital ED visits involving an eye injury and made up the majority of visits in age categories through age 74. (Figure 4) Seven percent of males and 5% of females reported assault as the cause of the injury. ED visits for eye injuries were concentrated among children and younger adults, with the number generally declining with increasing age.

DISCUSSION

Although the number of eye injuries treated in hospitals in Rhode Island annually reaches into the thousands, relatively few require immediate hospitalization as an inpatient. Nevertheless, the consequences of eye injuries to the patient can be substantial, as well as the costs to society, if lasting visual impairment results. The recent availability of data on ED visits for eye injuries in Rhode Island will support investigations into the types of injuries, their causes, and the affected populations, data that can guide public health efforts to prevent and control such injuries in our population.

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Disclosure of Financial Interests

The authors have no financial interests to disclose.

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