Oral Trauma in an Urban Emergency Department

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ABSTRACT

The purpose of this investigation was to determine the type of traumatic orofacial injuries and the referral pattern seen in children up to 15 years of age who came to the pediatric emergency department at an urban hospital during an 18-month period. The majority of injuries treated, 87% in preschool children and 71% in children ages 6 to 15 years old, were lacerations and/or abrasions. The primary mechanism of injury was falls, accounting for 78% of traumatic orofacial injuries in preschoolers and 47% in children ages 6 to 15 years. Children ages 6 to 15 years were more likely to be injured in sports-related activities and more likely to injure the dentition than preschool children. When referrals for follow-up care were documented, the majority was to the department of dentistry. (*J Dent Child.* 2004;71:14-16)

KEYWORDS: PEDIATRIC TRAUMA, EMERGENCY DEPARTMENT, OROFACIAL INJURY

hildren with orofacial injuries often come to hospital emergency departments. A number of studies over the past 20 years have reported the types and prevalence of orofacial injuries seen in hospital pediatric dental clinics or hospital emergency departments.¹⁻¹⁴ The information gathered in these studies provide useful descriptions of the common types of traumatic oral injuries that pediatric emergency care providers may encounter. Studies of the incidence, etiology, and distribution of these traumatic injuries provide health care planners with pertinent information to determine what types of emergency services should be available in the emergency department setting. The outcome of traumatic orofacial injuries may be improved when appropriate facilities and providers are available.

A review of the literature identified studies documenting different aspects of dentofacial trauma seen in children. For example, studies by Judd² and Galea³ reported injuries to primary and permanent anterior teeth seen in a pediatric emergency department. Both studies found that luxations and crown fractures were the most common injuries, falls were the most common mechanism of injury, and males were injured more often than females.

Other studies investigated traumatic injuries treated outside normal clinic hours, specifically weeknights, weekends, and holidays.⁴⁻⁷ These studies determined that anterior teeth were most commonly injured. Additionally, injuries treated after hours were more severe, usually involved more teeth, and occurred more commonly in older patients. In all studies, maxillary central incisors were cited as the most frequently injured teeth. When soft tissue injuries were reported, the most common were lacerations of the upper and lower lip, gingiva, and chin. The reported incidence of extraoral soft tissue injuries ranged from 19% to 62%, and the incidence of dental injuries, specifically tooth luxations and crown fractures, increased in patients with concomitant injuries to the lips and chin.^{1,3,8-10}

The purpose of this retrospective study was to determine the type and etiology of traumatic orofacial injuries, including injuries to soft tissue, teeth, and bones, seen in children up to 15 years of age who came to a major hospital pediatric emergency department and determine the referral patterns for further treatment.

METHODS

Data was collected from the medical records of all children ages 15 and younger who came to the pediatric emergency department at the University Hospital in Jackson, Miss, with

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Table 1. Types of Injuries by Age Group				
	Age			
Injury	<6 years old	6-15 years old		
Laceration/Abrasion	99 (87%)	39 (71%)		
Luxation/Avulsion	7 (6%)	8 (15%)		
Penetrating Injury	1 (1%)	0 (0%)		
Epitaxis/Contusion	3 (3%)	2 (4%)		
Fracture/Dislocation	4 (4%)	6 (11%)		
Total	114	55		

a traumatic orofacial injury. Medical records of patients seen during an 18-month period were reviewed for this retrospective study. The University Hospital is a tertiary-level teaching hospital that is part of the University of Mississippi Medical Center and includes a 130-bed pediatric hospital. When consulted by the emergency department physicians, residents in the Department of Advanced General Dentistry provided treatment to patients with oral injuries. The residents were supervised by dental faculty in the Department of Hospital Dentistry and Dental Specialties.

One reviewer collected all data from the patient's medical record. The data collected included the age, race and sex of the patient, date and time of injury, type of injury, anatomic location, mechanism of injury, and treatment rendered. It was also noted whether the patient experienced complications, received follow-up treatment in the emergency department, or was referred to a specialty service. The types of injuries were categorized as laceration/abrasion, luxation/avulsion, fracture/dislocation, penetrating injury, contusion/epistaxis, and other. The categories for anatomic location included: upper/ lower lip, intraoral soft tissues and maxillary/mandibular teeth, and upper/lower face. The mechanisms of injury were categorized as motor vehicle collisions, fall/tricycle/bicycle, sports/ struck by an object, and other.

All data were analyzed using the SPSS 10.0 Statistical Program software. Statistical analysis was performed using chi-square test. SPSS provides 2 options for treating missing values. The method used was to exclude cases listwise, where cases with missing values for any variable were excluded from analysis. In the data for this study there were no missing values in the variables analyzed. The University of Mississippi Medical Center Institutional Review Board approved this study.

RESULTS

Over an 18-month period, 169 children ages 15 years and younger presented with traumatic dentofacial injuries. Of the children treated, 107 (63%) were male, 62 (37%) female, 148 (88%) African-American and 21 (12%) white. Children younger than 6 years old accounted for 114 of the pediatric emergency room visits, and children ages 6 to 15 years old accounted for 55 visits. A summary of the types of injuries for each of the 2 age groups is presented in Table 1. The majority of injuries seen in both age groups were

	Age	
Injury	<6 years old	6-15 years old
MVC	4 (4%)	6 (11%)
Fall	89 (78%)	26 (47%)
Sports/Struck by Object	7 (6%)	16 (29%)
Other	14 (12%)	7 (13%)
Total	114	55

lacerations and/or abrasions, 99 (87%) in children younger than 6 years and 39 (71%) in 6- to 15-year-olds. Luxation/ avulsion followed as the second most frequent injury. Other injuries seen included epistaxis, contusions, penetrating injuries, dislocations, and fractures.

The mechanism of injury for each age group is shown in Table 2. The most common mechanism of injury for both groups was falls, however, that percentage was much higher among children younger than 6 years of age (89% or 78%) than for children 6 to 15 years of age (26% or 47%). Children ages 6 to 15 years were more often injured by sports-related/struck-by-an-object mechanism (16% or 29%) than were preschoolers (7% or 6%). The mechanisms of injury listed as "other" included tooth decay, dog bite, burns, and unknown. The mechanism of injury as a function of age groups was statistically significant (χ^2 =22.9, *P*<.001).

The location of the traumatic dentofacial injuries for the 2 age groups is shown in Table 3. The most common locations of injury for children under the age of 6 were the upper/lower lips followed by the teeth/intraoral soft tissue. However, in the 6- to 15-year-old group, the most common locations of injury were the teeth/intraoral soft tissues followed by the upper/lower face. There was a significant difference in the location of injuries found in the 2 age groups (χ^2 =12.8, *P*<.002).

Of the 114 children younger than 6 years of age seen in the pediatric emergency department, 30% were referred to another service, and in the 6- to 15-year-old age group 42% were referred. For both age groups the majority of the referrals for further treatment of dentofacial injuries were to the

Table 3. Location of Injury				
	Age			
Injury	<6 years old	6-15 years old		
Upper/Lower Lip	63 (55%)	16 (29%)		
Max/Mand Teeth	33 (29%)	19 (35%)		
Upper/Lower Face	18 (16%)	20 (36%)		
Total	114	55		

department of dentistry (56% of preschoolers and 70% of 6to 15-year-olds). For the majority of children in each age group (83% of the preschool children and 67% of the school-age children) there was no documented follow-up care. However, follow-up care that was documented generally occurred in the emergency department.

DISCUSSION

In this study, soft tissue injuries, including lacerations and abrasions, accounted for 87% of orofacial trauma in children younger than 6 years old, compared to 71% in older children. The lack of coordination in younger children may have contributed to the higher incidence of lacerations. Wilson et al¹² described a common scenario of lacerations occurring when a toddler bit the tongue or lip as the mandible struck an object during a fall. This resulted from a younger child's inability to use his or her upper extremities for bracing during a fall. Children 6 to 15 years old experienced more injuries to teeth, and the injuries sustained were more serious as evidenced by the higher percentage of luxations, avulsions, fractures, and dislocations. These findings were consistent with similar studies.^{1,8,11,14}

Falls were the most common mechanism of injury in both age groups. In fact, 78% of all injuries to preschool children resulted from falls. These occurred commonly as children became ambulatory but had not yet developed mature motor skills. By comparison, the older children were much more likely to experience sports-related/struckby-object type injuries (29%) than the children younger than 6 years (6%). This finding was not unexpected since children in this age group were more likely to be involved in either recreational or organized sports activities.

The most common locations of injury in preschool children were the lips, whereas the most locations of injury in the 6- to 15-year-old age group were the anterior teeth and lower face. The location of injury seen in this sample population may have been directly related to the mechanism of injury. Younger children who sustained injuries from a fall were more likely to traumatize lips than teeth, and older children who were injured in sports activities or who were struck by an object more often injured the dentition.

Referrals to other hospital services following traumatic orofacial injuries were generally not documented, however, when referrals were noted, the majority were to the department of dentistry. During the timeframe studied there was no mechanism for mandatory referral to the department of dentistry. Since many orofacial injuries required dental intervention or follow-up, the need for the emergency personnel to distinguish the severity of the injury and recognize the need for referral was imperative.

Patients seeking care for traumatic dental injuries in an emergency department may do so because of a lack of a family dentist and therefore use the emergency department personnel as primary care providers. The sample population in this study may not have represented the pediatric patients treated for traumatic dental injuries outside of the emergency setting. However, data from studies such as this one can show trends and common scenarios of pediatric dental trauma presenting to emergency departments.

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