A Retrospective Review of Pediatric Oral and Maxillofacial Trauma Seen In an Urban Level I Trauma Center

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A significant amount of children are injured in the United States annually; numbers reach an average of 22 million \(^1\) and injuries are a leading cause of death for infants and children in the United States and around the world.
Objective: The purpose of this study was to determine the predominant causes of maxillofacial trauma, and resultant injuries, suffered by children 18 years of age or less in the South Bronx, New York by conducting a clinical retrospective analysis. The specific aims of the study were to measure several variables in the study group against their suffered injuries, and suggest preventive measures for consideration.

Study Design/Sample: To address the research purpose, the investigators designed and implemented a retrospective study of patients aged 0 to 18 years presented to the Pediatric Emergency Department of Lincoln Medical Center for evaluation and management of oral and maxillofacial injuries between November 2014 and January 2016. This study has received approval from the Hospital's Review Board. [The assigned IRB Number is 16-018]

Data Collection: Data was obtained by review of the medical records of the study population. To be included in the study sample, patients had to be 18 years of age or younger, have sustained an injury in the maxillofacial region, presented to Lincoln Medical Center in the South Bronx, New York for treatment, and had an oral surgery resident consulted for their care. A complete record of the care rendered to the patient was needed. Patients were excluded from the study population if they were treated by the Emergency Department staff, were over the age of 18, had incomplete data sets, presented with unrelated pathology, or had an abrasion without concurrent injury.

Variables: Descriptive variables include age and gender of the patient, etiology, time of day and month, and place of occurrence of the injury. Outcome variables include type, frequency, and location of injury. [Table 1]

Additional Data Collection: Additional outcome variables – level of supervision, time of day and place of occurrence -- were obtained from a smaller subgroup of 42 patient charts selected at random from the original patient population. [Table 2]

Results: From November 1, 2014 to January 31, 2016, 512 children and young adolescents, aged 18 years and younger, who sustained oral and maxillofacial injuries, were treated at the Lincoln Medical Center's Pediatric Emergency Department. Our results differed somewhat from similar studies. Trip and fall accidents was the major causes of injury followed by assaults, sports injuries and other causes. A greater proportion of injured patients were boys resulting in a gender ratio of nearly 2:1. The mean age of the cohort was 7.88 years. The time of the day distribution peaked between 6pm and midnight, when 55.46% of injuries occurred, and the lowest occurrence was between 6 am and noon, when less than 5% of injuries occurred.

Of the injuries sustained, lacerations predominated, with 439 lacerations of the 512 total injuries. Dentoalveolar injuries, facial bone fractures and other injuries (abrasions and burns) followed in occurrence in ever decreasing number. Most of the lacerations, approximately 25%, were located in the frontal region and, in descending order, in the periorbital, perioral, mental, intraoral, auricular, malar and, least frequently, the nasal region. Lacerations
were repaired by primary closure under local anesthesia as an out-patient. In
the rare occasions that a mandibular fracture was sustained, the fracture was
repaired with ORIF/CRMMF as an in-patient. Many lacerations could have been prevented with more direct supervision. The majority of the facial fractures could also be prevented with behavior management. There are numerous interventions suggested in the Injury Prevention section that range from cushion corners to preventative social programs.

Randomly selected records of 42 patients had extended parameters observed: supervision, day of injury, and setting of occurrence of the injury. The vast majority of injuries, 64.29%, occurred in the presence of the child’s parent. In this subset, the greatest number of injuries seen occurred on Thursdays and Fridays; with the least occurrences on Sunday. 19.05% of injuries occurred on each Thursday and Friday whereas there were half that amount, less than 10 %, each Sunday.

The greatest number of maxillofacial injuries seen in the Pediatric ED occurred at home; very few occurred at each of other reported locations (street, school, athletic field, playground or park).

Discussion: When there is an understanding of the cause of pediatric trauma, it may then be possible to put in place measures to prevent injuries to children from occurring. We found that the South Bronx differs from the rest of the country in the etiology of its pediatric maxillofacial trauma. Thus, most of the injuries seen in our study were lacerations. The most common location was the forehead, the most prominent feature of the young child’s face.

The remainder of the discussion focuses on possible solutions to address each etiology. There is an entire section on injury prevention. For example, “Guns Down, Life Up,” is sponsored by New York City Health and Hospitals Corporation in response to violence in this community. There are multiple established programs across the city including the one at Lincoln Medical Center in the South Bronx. It provides opportunities for youth to engage in positive activities such as sports and dance.

Conclusion: Pediatric injuries are present in any population. From November 1, 2014, to January 31, 2016, our investigation revealed 512 oral and maxillofacial injuries presenting to the Pediatric Emergency Department in our hospital in the South Bronx. Reduction in the amount and severity of pediatric injury in any area requires a combination of education, community activity, and interdependent care of all children. Parents, schools, and communities must act together to lessen the number and degree of these injuries sustained by our youngest, most vulnerable citizens. It is our hope that presentation of this material will be an impetus for further investigation into the causes of injuries to children, as well as a positive change in those factors controlling the daily activities in the community so as to lead to a lessening of pediatric maxillofacial injuries.