Scooter Injuries: A New Pediatric Morbidity

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ABSTRACT. Objective. To describe types of injuries, mechanisms of injury, and treatment of injuries caused by scooter use in children, and to discuss issues of injury prevention in children who use scooters.

Study Design. Data were collected from 14 children seen by a general pediatrician and an orthopedic surgeon over a 3-month period in the summer of 2000. Detailed histories were obtained from patients and their families, and medical records were reviewed.

Results. Eleven of the 14 patients suffered fractures. The injuries in the other 3 patients were a large abrasion, a laceration, and a septic knee. Half (7) of the children were injured within the first day of riding their scooter, and 13 of the 14 injuries occurred within the first month of scooter use. Only 5 patients used protective gear at the time of their injuries, and those patients were injured in unprotected parts of their bodies.

Conclusions. The popularity of scooters presents a new cause of pediatric injuries and a significant health hazard to children. In our study, most injuries occurred shortly after children began scooter use, and younger children suffered the most severe injuries. Additional studies are needed to determine how scooter-related injuries can be prevented or minimized. Pediatrics 2001; 108(1). URL: http://www.pediatrics.org/cgi/content/full/108/1/2; scooters, injuries.


Scooters (Fig 1) present a new cause of pediatric injuries. On September 5, 2000, the United States Consumer Product Safety Commission (CPSC) reported through their National Electronic Injury Surveillance System a 700% rise in unpowered scooter-related emergency department visits during the summer of 2000.1 In November 2000, the CPSC updated this data, reporting 27,600 emergency department visits for scooter injuries from January to October 2000. 85% of which were in children under 15 years of age.2 Most injuries were fractures or dislocations, predominantly in the upper extremities, followed in frequency by lacerations, contusions/abrasions, and strains/sprains. The CPSC reported 2 deaths from scooter injuries: a 6-year-old boy who rode into traffic and was struck by a car and an adult who fell and struck his head.

No case-based study describing these injuries has been published. In this article, we describe a group of 14 patients seen during the summer of 2000 in our pediatric and orthopedic practices. The purpose of this study is to describe the types of injuries, mechanisms of injury, and treatment of injuries caused by scooter use in children, and to discuss issues of injury prevention in this population.

STUDY DESIGN

During a 3-month period from July to September 2000, pediatricians in an 8-person private practice in Berkeley and Orinda, California, and an orthopedic surgeon at Children’s Hospital Oakland, in Oakland, California, cared for 14 patients who sustained injuries while riding scooters. Only those patients who were seen by the authors for such injuries are described in this study. All patients were treated in the authors’ practices, and diagnoses were made by physical examination, imaging studies, and, in 1 patient, by needle aspiration and culture of the knee joint. Detailed histories were obtained from the patients and their families, and the patients’ medical records were reviewed. Histories included information about how the injuries occurred; what, if any, protective gear was worn; if adults were supervising the child when the injury occurred; how long the patient had used the scooter (ie, the length of time between their first use of the scooter and the injuries); and if they had a past history of any significant trauma. The authors confirmed history details by follow-up telephone and in-person interviews. We report the injuries sustained and the ages, gender, injury mechanisms, treatment, and preventive considerations in this patient population.

RESULTS

Fourteen patients sustained scooter-related injuries. Their ages, sex, and type of injury are presented in Table 1. The patients ranged in age from 5 to 14 years; 9 were boys and 5 were girls. Eleven patients presented with fractures, and 5 of these patients had 2 or more fractures. Of these fractures, 7 involved the upper extremities, 4 the lower extremities, and 1 was a skull fracture. The other 3 patients presented with an abrasion, a laceration, and a septic knee, respectively.

Table 2 describes both the causes of the injuries that led to the injuries and how the injuries were treated. Eight of the 14 patients stated 2 or more reasons for their injuries. The most common reasons reported were going too fast (9), striking an object on the pavement (7), and inability to brake (4). Four patients required inpatient hospitalization. Eleven patients required casts. Of these, 1 required closed reduction of a distal radius fracture and 2 needed open reduction and internal fixation of distal radius and ulna fractures. A third patient in this group had intramedullary rods placed to stabilize the displaced, severely comminuted (fragmented) fracture of his proximal femur. One patient sustained an open, depressed skull fracture that required emergent neu-
rosurgical elevation and repair of the skull. Another patient developed a Staphylococcus aureus infection of the knee joint after trauma to the knee in a fall from his scooter. The diagnosis was made by needle aspiration of the knee joint with confirmation by culture. He was treated with parenteral antibiotics for 2 weeks. The child with the knee laceration required 8 stitches, and a child with the 25 cm abrasion to his leg had frequent debridements and dressing changes.

Potential preventive measures were examined (Table 3). Five patients were wearing protective gear at the time of their injuries, but were not protected against the injury sustained. Four patients were supervised by an adult at the time of the injuries. All but 1 patient had been using their scooter for 1 month or less; 7 of the injuries occurred on the patients’ first day of use. Four patients had a history of previous fractures.

**DISCUSSION**

Injuries are commonly seen in pediatric practice, and over the last few years many articles have been published about bicycle, skateboard, rollerblade, and in-line skating injuries in children. Preventive measures, primarily use of protective gear, have helped reduce the incidence and severity of these injuries. A new type of scooter, which has been marketed and sold in the last year, has led to a marked increase in scooter-related pediatric injuries. These scooters are foot-propelled, kick-powered devices that have small in-line skate wheels connected to a narrow footrest. At the front of the footrest is an upright post with handlebars at the top. Most scooters are made of aluminum, weigh <10 pounds, and can be folded into a small, compact carrying unit. It is estimated that 5 million of these scooters will be sold in the United States this year, at a price ranging between $80 and $120 per scooter.

We describe 14 patients who sustained significant morbidity from scooter injuries during the summer of 2000. Most of the injuries were fractures. Four patients required hospitalization and 7 underwent surgical procedures. All were 14 years old or younger, and most were male. All of these injuries occurred with the same kind of scooter, the Razor, made by JD Corporation. Most were also inexperienced scooter users. The younger the patient, the more serious the injuries. In our group, 2 of the youngest patients sustained the most severe injuries. The most commonly reported mechanism of injury was speeding, ie, moving too fast to maintain control. Neither adult supervision nor protective gear was effective in preventing these injuries.

The cornerstone to pediatric practice is prevention, and we analyzed protective factors that might have prevented the risk of injury. Although our sample was small, protective gear, parental supervision, and absence of a past history of trauma had no preventive impact. It has been speculated that protective gear will reduce the risk of scooter injuries, but this is questionable. Protective gear did protect against the area it covered (eg, there were no wrist fractures among the children who were wearing wrist guards), but scooter injuries expose so much of the body to injury that a child would need to wear full-body protective gear. This is exemplified by the patient who was wearing 4 different kinds of protective devices, but still sustained a fracture of the distal tibia—an area not covered by any of his protective gear.

The construction of these new scooters may be contributing to the rise in injuries, as their light weight enhances speed and their narrow, small wheels make them difficult for children to control. We identified 3 additional contributing factors:

1. When riding the scooter, the rider’s weight is positioned forward near the front wheel. Leaning on the handlebars to make a turn increases the risk of tipping over forward.
2. Pushing the scooter requires 1 foot on the footrest and the “push” foot on the ground. Should the scooter lean too far away from the push foot to-
ward the opposite side of the body, the foot on the footrest stays where it is and cannot stabilize or stop the scooter from tipping over.

3. The scooter’s wheels are small and close together, compounding the scooter’s instability if it hits even a small obstacle on the street (eg, a pebble, stone, or crack in the pavement).

This study is a descriptive case series, the most common study design for newly emergent public health problems. We did not calculate incidence rates in the local population because of a lack of comprehensive case ascertainment, nor did we attempt to calculate the incidence per scooter hour. However, scooters have become a new source of morbidity in children throughout the United States. Increased sales and continuing popularity of scooters portend a continuation of this trend. At present, our best recommendation is that all children should wear protective gear, especially helmets, while riding scooters. Further pediatric studies are necessary to determine what additional steps can be taken to prevent scooter-related injuries.

REFERENCES


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