Injury, Int. J. Care Injured 45 (2014) 1215–1219

Contents lists available at ScienceDirect

Injury

journal homepage: www.elsevier.com/locate/injury

Longboard and skateboard injuries

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ARTICLE INFO

Article history:
Accepted 14 March 2014

Keywords:
Adolescent
Athletic injuries/epidemiology
Accidental falls/statistics & numerical data*
Skating/injuries*

ABSTRACT

Introduction: The causes and events related to skateboarding injuries have been widely documented. However, little is known about longboard-related injuries. With five deaths linked to longboarding in the United States and Canada in 2012, some cities are already considering banning the practice. This study compared the types and causes of longboarding-related injuries to those associated with skateboarding.
Methods: We conducted a retrospective cohort study, using an emergency-based surveillance system, on patients under the age of 18 who had been injured while longboarding or skateboarding between 2006 and 2010.
Results: A total of 287 longboarding and 4198 skateboarding cases were identified. There were more females in the longboarding group (18.8%) than in the skateboarding one (10.7%, $p < 0.002$). All the injured longboarders were older than 10 years of age while a fifth of the injured skateboarders were under the age of 11. Longboarders' injuries occurred mainly on streets and roads (75.3% vs. 34.3% in skateboarders, $p < 0.000$) and rarely in skate parks (1.4% vs. 26.4% in skateboarders, $p < 0.000$). Longboarders suffered twice as many injuries to their heads and necks (23.3% vs. 13.1%, $p < 0.000$) and twice as many severe neurological traumas (8.6 vs. 3.7%, $p < 0.000$) while skateboarders suffered more injuries to their lower extremities (33.7% vs. 24.7%, $p < 0.002$).
Conclusion: Longboarding is associated with a different pattern of injuries than skateboarding. Because longboarders suffer more intracranial injuries, the importance of helmet use should be especially strongly reinforced.

Introduction

With five deaths related to longboarding in the United States and Canada in 2012, 4 in 2013 and already one in 2014, some cities are now considering banning the activity [1–3]. Longboarding has been part of the sporting landscape since the late 1950s and became popular in the early 1990s in California [4,5]. By 2008, the number of longboarders in the United States was estimated to be around 750,000 [6]. Despite the sport's popularity, only a small amount of research that is specific to the injuries of longboarders has been published in the scientific literature. In contrast, skateboarding injuries have been the subject of over 60 papers.

Longboards are long skateboards (from 36 to 60 in.) while skateboards are no longer than 33 inches. Longboards have wider decks (or boards) and wheels with larger diameters; this decreases rolling resistance, allowing for greater speeds. Whereas skateboards are often used to perform special manoeuvres or tricks in skate parks (jumps, sliding along guardrails, spins, etc.) [7], longboards offer better stability at higher speeds and better comfort when tackling long distances [8]. Longboards are also used for downhill racing, with the present world record set at 81 m/h [9].

Falls and motor vehicle collisions have been identified as the two major causes of skateboarding injuries [10]. The most frequent injuries among skateboarders are musculoskeletal and involve the upper (55–63%) [11,12] and lower (22–26%) [11–13] extremities. Some researchers have estimated the incidence of head injuries to be between 14% and 50% [11–14]. Skateboarding injuries show a striking gender difference: between 77% and 91% of those injured are males [11–16]. While the majority of skateboarders are older teenagers and young adults [15,17], children who are 7-to-11 years of age make up between 8% and 40% of all injured skaters [10,14].

Since longboards differ from skateboards in design, use and place of practice, we postulated that each of the two activities is associated with a different pattern of injuries. The aim of this study was to compare the injury profiles of young longboarders and

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http://dx.doi.org/10.1016/j.injury.2014.03.010

skateboarders who presented to emergency departments (EDs) in Canadian hospitals.

Methods

Data source

Data were obtained from the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP), a national surveillance system based on ED data from 14 hospitals in Canada [18,19]. Patients or parents of patients who go to the ED are asked to fill out a one-page questionnaire and provide detailed information regarding the injury that brought them there. Clinical data (nature of the injury, body part and level of treatment) is extracted from the ED record by CHIRPP coordinators at each site. All questionnaires are sent to the Public Health Agency of Canada to be entered electronically by trained coders. Research has shown that CHIRPP data represent common injury patterns of Canadian children and youth [20,21].

Data extraction and analysis

Our study was restricted to children under the age of 18 who visited an ED between 2008 and 2010 for an injury that occurred while longboarding or skateboarding. Cases were identified using the text that described the injury on the CHIRPP form. To ensure complete capture, we searched narratives using the following bilingual (French and English) text strings: "skateboard", "longboard", "wakeboard" and "planche-a-roulette". Cleaning of the data set involved excluding cases where the participant was neither longboarding nor skateboarding (e.g., "a kid hit me with his skateboard.")

Given that CHIRPP includes 100 different body parts and 80 different injury diagnostics, we grouped these in two broader categories for the purpose of this study. The first included four body parts: the head and neck, upper extremity, lower extremity and trunk; the second covered six types of injuries: – intracranial injuries (including concussion and suspected concussion, visible injuries to the brain, skull fractures and spine injuries), dental injuries, fractures, soft tissue injuries (including bruising, abrasions and lacerations), sprains and injuries to the internal organs.

Like most of the research that has already been done, we used the level of treatment received in the ED to determine the severity of the injury [22,23]. Injuries that were treated only in the ED were classified as minor while those for which the patient was kept under observation in the ED, or required a follow-up or admission were considered severe.

In order to provide a more complete assessment of the injuries, narrative descriptions (patients' or parents' written accounts of the events) were individually reviewed and coded according to four mechanisms: the subject fell while travelling, fell while going down a hill or was injured while performing special manoeuvres or the injury was caused by a motor vehicle. Six different locations were used to categorise where the injury took place: spaces shared by motor vehicles (streets and parking lots), bike paths, skate parks, open spaces (parks and school yards), residential and unspecified. Finally, the incidence of helmet use was also reported for both activities.

Statistical analysis

Descriptive analyses based on age, gender, mechanisms of injury, location, helmet use, body part, nature and severity of injury were profiled according to longboarding and skateboarding. Means with confidence intervals (95%) were calculated for age and compared using *t*-test. Pearson's Chi square statistics were used to compare the categorical data between the two activities. Calculations and analyses were performed using SPSS 17.0, and results were deemed significant at $\alpha = 0.05$ (2-tailed).

Results

Demographics and location

The first table (refer to Table 1) shows the age, gender and location (i.e., where the injury happened) of the 4485 selected cases, 287 of which were due to longboarding and 4198 to skateboarding. The mean age of the injured longboarders and

Table 1
Numbers and percentages of longboarding and skateboarding injuries by age, gender and location.

	All cases		Longboard		Skateboard	
	$n = 4485$	%	$n = 287$	%	$n = 4198$	%
Age group						
2–4	34	(0.8)	0	(0.0)	34	(0.8)
5–10	755	(16.8)	0	(0.0)	755	(18.0)
11–14	2464	(54.9)	153	(53.3)	2311	(55.1)
15–17	1232	(27.5)	134	(46.7)	1098	(26.2)
					$\chi^2 = 94.25$, $p < 0.000$	
Gender						
Male	3980	(88.8)	233	(81.2)	3748	(89.3)
Female	504	(11.2)	54	(18.8)	450	(10.7)
					$\chi^2 = 10.08$, $p < 0.002$	
Location						
Vehicles	1819	(40.6)	219	(76.3)	1600	(38.1)
Road, street	1655	(36.9)	216	(75.3)	1440	(34.3)
Parking lot	163	(3.6)	3	(1.0)	160	(3.8)
Bike path	45	(1.0)	24	(8.4)	21	(0.5)
Skate park	1113	(24.8)	4	(1.4)	1109	(26.4)
Open spaces	601	(13.4)	11	(3.8)	590	(14.1)
Park	428	(9.5)	8	(2.8)	420	(10.0)
School	173	(3.9)	3	(1.0)	170	(4.0)
Residential	512	(11.4)	1	(0.3)	511	(12.2)
Unspecified	395	(8.8)	28	(9.8)	367	(8.7)
					$\chi^2 = 256.41$, $p < 0.000$	