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Orofacial and dental injuries of snowboarders in Turkey

Esber Çaglar, Ozgur Onder Kuscu, Serhat Çalişkan, Nuket Sandalli

Department of Paediatric Dentistry, Dental School, Yeditepe University, Istanbul, Turkey

Correspondence to: Esber Caglar, Department of Paediatric Dentistry, School of Dentistry, Yeditepe University, Bagdat cad 238, Goztepe 34728 Istanbul, Turkey
Tel.: +90 216 3636044/6414
Fax: +90 216 3636211
e-mail: caglares@yahoo.com

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Abstract – *Background/Aims*: Snowboard riding has increased in popularity during the last decade and is also remarkable for its dramatic rise in association with serious injuries. The aim of this study was to evaluate the nature of dental or orofacial trauma in snowboard riders in Turkey, as well as to investigate if adolescent and young adult snowboard riders were aware of any protective measures. *Methods*: An epidemiological survey was carried out through interviews with 86 snowboard riders in Turkey. *Results and Conclusions*: Seventeen snowboard riders had been affected by orofacial trauma. Results revealed that all snowboarders were aware of helmet protection whereas 50 out of 86 (58%) reported that they used them. It should be concluded that from the moment a youngster begins to practice snowboard riding, (s)he should be encouraged to wear a helmet and a properly fitted mouthguard as part of the necessary protection for them to safely enjoy their sport.

The first snowboards were developed during the 1960s in Michigan, USA. Snowboard riding has gained popularity during the last decade and now accounts for some 20% of Swedish down hill skiing (1). The sport was formally recognized by its representation in the Olympic Games at Nagano in 1998 (2). However, snowboard riding is also remarkable for its dramatic rise in association with serious injuries such as splenic tears and head injuries caused by blunt trauma (3). Snowboard riders are at high injury risk as they may practice their sport outside of commercial skiing areas including snowboarding down mountains in addition to jumps, half-pipes, stunt boarding, and extraordinary behaviors (Fig. 1). Most studies on child and adolescent snowboard riders indicate that the wrist and forearm are most frequently injured in snowboard riders due to an upper extremity impact mechanism (4–7). In fact, it has been reported that head trauma is the leading cause of death among snowboard riders (8).

Today it is well known that participating in sport activities also places children and adolescents at risk for dental or orofacial trauma (9–12). At this point, dental trauma in sports differs form other sources, as it is possible to reduce or prevent and reduce the dental and orofacial trauma by education and the use of protection devices such as helmets, face guards and mouthguards (13, 14).

As the popularity of snowboard riding increases, snowboard injuries in children and adolescents also are increasing. There are no reports in the scientific literature of dental and orofacial trauma related to snowboard riding. The aim of this study was to evaluate the nature of dental or orofacial trauma in snowboard riders in Turkey, as well as to investigate if snowboard riders were aware of any protective measures.

Methods

The study sample was obtained from the existing program data of the National Snowboard Branch of the Turkish Ski Federation (http://kayak.org.tr/). Information was obtained in December 2008 from personal interviews and questionnaires answered by snowboard riders in SnowFests at a major winter ski center (Kartalkaya); national competing snowboarders in the Annual National Snowboard Summer Camp at Ankara, and registered clubs' snowboard riders of the National Snowboard Federation, Turkey.

The questionnaire was modified from the trauma questionnaire sheet earlier presented by Caglar et al. (9, 10, 12). Items included were: name, age, gender, city, the occurrence of general injuries, and the occurrence of any dental or orofacial trauma separated into the following categories injury:

1 dentoalveolar trauma
2 soft tissue plus dentoalveolar trauma
3 bone tissue (mandible)
4 soft tissue (lips)
5 other injuries away from the face.

Whether the snowboarder was:

1 having any orthodontic treatment at the time of the injury
2 aware of the need to use a helmet and mouthguard while riding.

The statistical evaluation was performed using the aspects of dental and orofacial trauma history, years of

Fig. 1. Misbehaviors while snowboard riding may cause dental and orofacial trauma.

experience, gender, and helmet protection. The collected data were analyzed using version 10.0 of the SPSS software (SPSS Inc., Chicago, IL, USA) for Windows and the level significance was set at 5%. Chi-square test was applied for statistical analysis.

Results

Eighty-six snowboard riders were provided information from five Turkish cities (Ankara, Bursa, Bolu, Erzurum, and Istanbul). Thirty-one adolescents (40%) accounted for all snowboard riders whereas 51 (60%) were young adults. Mean ages were 16.4 ± 1.9 for adolescents and 24 ± 3.9 for young adults. Regarding gender, 24 (30%) of the snowboard riders were female while 62 (79%) were male (Table 1). There were no statistically significant difference in trauma history regarding age groups. ($P > 0.05$) Regarding gender of the traumatized snowboard riders, five were females (29.41%) and 12 were males (70.59%).($P > 0.05$)

Years of experience are shown in Table 1. Among snowboard riders, 3–5 years of experience was higher than any other experience intervals. However, regarding year of experience of the traumatized snowboard riders, there were no statistically difference between groups ($P > 0.05$).

Forty-nine snowboard riders (57%) had already been affected by general trauma (including dental and orofacial trauma) whereas 17 (20%) of snowboard riders had dental or orofacial trauma (Table 1). Regarding distribution of dental and orofacial traumatic injuries, soft tissue injuries consisted of the majority of trauma cases (Table 2).

The distribution of snowboard riders with respect to protection methods is listed in Table 3. Of the 86 snowboard riders, 50 (58%) stated that (s)he wore a helmet in training or in competition. Of the 17 snowboard riders who had dental or orofacial trauma, nine (53%) reported that (s)he did not wear a helmet. Only 16 (19%) reported knowledge of a mouthguard; however, none reported its usage.

None of the five snowboard riders who were wearing orthodontic appliances had sustained dental or orofacial injuries.

Table 1. Description of the sample

Variable	*n*
Age	
Adolescents (13–19)	35
Young adults (20–29)	51
Gender	
Female	24
Male	62
Years of experience (years)	
0–2	22
3–5	34
6–9	19
+10	11
General injuries (Cases)	
Ankle	6
Brain damage	1
Dental and orofacial lower limb	17
Neck	7
Nose	4
Shoulder	3
Upper limb	6

Discussion

Turkey has over 20 winter ski centers, hosts 'Winter Universiade 2011' and snowboard riding has been gaining popularity at the expense of skiing, in particular,

Table 2. Distribution of dental and orofacial traumatic injuries

Type of injury	*n*
Dentoalveolar trauma (teeth)	2
Soft tissue + Dentoalveolar trauma	3
Bone tissue (mandible)	3
Soft tissue (lips, tongue)	10
Injury outside of face	3

Table 3. Distribution of snowboarders regarding their use of protection devices

	Awareness of protection methods							
	Emergency training		Helmet		Mouthguard		Usage of Helmet	
Self-estimated classification of snowboarders	*n*	%	*n*	%	*n*	%	*n*	%
Personal (*n* = 28)	0	0	28	100	4	14	13	46
Club member (*n* = 38)	1	2	38	100	6	16	19	50
National snowboarders (*n* = 20)	0	0	20	100	6	30	18	90
Total	1	1	86	100	16	19	50	58

Fig. 2. Snowboard riding gaining popularity among the younger set.

among the younger set (Fig. 2). The rise in popularity, however, has meant that snowboard riding is now labeled as an emerging injury-producing sports-related activity in children and adolescents (15). There is evidence that snowboard riding injury rates are among the highest of sports-related injury rates in the 9- to 19-year-old age group (16). In this study, the most frequent type of injuries reported regarding general injuries were dental and orofacial injuries (Table 1). While there are no known reports on dental and orofacial trauma related to snowboard riding, a recent 2-years survey demonstrated that for children having dental trauma who visited a pediatric dentistry department in Istanbul, only 0.3% suffered from dental trauma in connection with snowboard riding (laceration, crushing with a skier) (17).

Surprisingly, little research has been conducted on the effectiveness of helmets in preventing head injuries in snowboard riders. Oh & Schmid (18) suggested mandatory helmet use for children and adolescents up to 17-years old as long ago as 1983. Recently, Macnab et al. (19) stated that for snowboard riders under 13 years of age, helmet use reduces the incidence of head injury requiring investigation and/or treatment. Also Machold et al. (20) found that failure to use a helmet increased the risk of a head injury. Currently, a case–control study of Mueller et al. (21) states helmets may provide protection from head injury among snowboard riders involved in falls or collisions. In this study of snowboard riders who had dental or orofacial trauma, 52.9% reported that (s)he did not wear a helmet and age group.

Regarding dental or orofacial trauma, bone tissue injuries were higher indications of the necessity of combined usage of external protection devices such as a helmet with a face shield. This consequence could probably be due to the impact nature of the sport. The Turkish Ski Federation instructs riders to wear helmets while snowboard riding (22). However, the standards of the helmet are not indicated. It should be noted that the helmet is designed to prevent brain injury, not dental injury. Therefore, a full-face snowboard helmet, rather than a conventional snowboard helmet, is recommended. Full-face snowboard helmets (with ASTM F2040 Certification or CE EN1077) are the most extensive form of snowboard protection gear because they have a chin bar that extends across the face, and they offer additional protection for the front of the face and jaw.

Regarding protection methods, of the 86 snowboard riders, all were aware of the importance of helmet usage. However, only 90% of national snowboarders, 50% of team members, and 46% of personal snowboarders stated that they had worn a helmet.

Regarding mouthguards, there are currently no guidelines while the use of mouthguards is strongly recommended in youngsters by the Canadian Snowboard Federation (23). In this study, none of the snowboarders used mouthguards. We believe that an information

programme emphasizing the importance of helmet and mouthguard use, as well as first aid measures for dental trauma, is vital for snowboarders; whereas emergency education should be a part of snowboard training. In this study, only one of the snowboard riders had any emergency training.

In conclusion,

1 Only one-half of the snowboarders interviewed wore helmets. Children, adolescents, and adults should be encouraged to wear helmets and properly fitted mouthguards.

2 Emergency departments in winter ski areas and cities should be regularly informed about protective headgear, as the apparent absence of upper extremity and head injuries might mask or delay the diagnosis and treatment of dental and orofacial injury.

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