

On the causes of traumatic dental injuries with special reference to sports accidents in a sample of Finnish children

A study of a clinical patient material

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Causes of traumatic dental injuries were studied in a sample of 321 Finnish children with injured permanent incisors. In girls the most common cause was falls (36.7%), and with boys sports (33.6%). Among the sports accidents, gymnastics dominated for girls and ice hockey for boys. Bicycling was also a markedly frequent cause of accidents in boys. The proportion of severe injuries was significantly higher in ice hockey and bicycling accidents than in other sports accidents.

Key-words: Pedodontics, trauma-frequency and extent

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Possibilities of preventing dental injuries do not exist without information about the causes of these injuries. The aim of the present study was to examine the causes of traumatic dental injuries in Finnish children, with special reference to sports accidents. Many studies on the causes of injuries have previously been performed in Scandinavia (2, 4, 5, 6, 9, 10, 11, 12) or in England (3, 16, 17).

MATERIAL AND METHODS

The material used in this study consisted of 321 children, 98 girls and 223 boys, with 450 traumatically injured permanent anterior teeth, recorded during 1972-75 in the school dental clinics of the city of Lahti in Southern Finland and sampled for a previous study by the author (7) (Table 1). The children were examined in a dental clinic as soon as

possible after the accidents. Traumatic injuries to permanent incisors were recorded in visual and radiographic examinations, and classified according to the classification of Andreasen (1). The following divisions were used in evaluating the severity of the injuries:

- Slight injuries (63.3 %): Crown infraction, enamel fracture, enamel-dentin fracture, concussion.
- Severe injuries (36.7 %): Complicated crown fracture, crown-root fracture, root fracture, subluxation, luxation, exarticulation.

In cases with two separate diagnoses for a single tooth (e.g. crown fracture and periodontal injury), the severity of the injury was defined according to the most severe diagnosis of the two.

The causes of injuries were recorded according to the information given by the child itself, by its parents, or by the teacher. The classification of the causes was limited to eight groups (Table 2), which was considered sufficient to comprise the actual causes of the accidents (11).

The statistical analysis of the material was made by the chi-square test.

RESULTS

The most common causes of injuries were sports and falls (Table 2). In girls the accidents were more frequently caused by falls than in boys ($p < 0.001$), whereas in boys they were more frequently caused through sports ($p < 0.01$). The group «other causes» included some infrequent causes, such as work accidents, a blow to the tooth by a key hanging around the neck, or bite injuries. The most common causes among sports accidents were gymnastics in girls and ice

hockey in boys. Only one of the ice hockey accidents was caused by organized sports. Bicycling was also a markedly frequent cause of injury, especially in boys (Table 3).

The proportion of severe injuries was significantly higher in ice hockey ($p < 0.001$) and bicycling ($p < 0.05$) accidents than in other sports accidents (60.0 %, 48.0 %, and 23.7 %, respectively).

DISCUSSION

The present study was carried out on a selected sample of children with injured teeth. This procedure may have a certain influence upon the distribution of the causes of injuries. On the other hand, in a retrospective study with unselected population sample, the methodical error may be even greater, a marked part of the children being unable to remember how the injuries to the teeth occurred (7).

In the present study, the most common causes of injuries were falls in girls and sports in boys. The difference between the sexes reflects obviously different behaviour patterns and sexual roles in girls and boys.

Sports accidents have generally been more frequent in Finnish (4, 6) and Swedish (9, 10) samples than in other materials (3, 11, 12, 14, 16, 17). Climatic differences, which make it possible to engage in several winter sports including such team games as bandy and ice hockey in Finland and Sweden, but not for example in Denmark and England, are in this respect of remarkable importance. According to the present, as well as to previous findings (4, 9, 10), ice hockey in particular seems to be a very specific cause of dental injuries in Finnish and Swedish boys.

Table 1. *Distribution of the subjects by age and sex*

	Age at last birthday												Total
	5	6	7	8	9	10	11	12	13	14	15	16	
Girls	-	5	20	11	19	13	11	5	6	4	4	-	98
Boys	2	6	25	46	45	29	19	19	14	6	7	5	223
Girls and boys	2	11	45	57	64	42	30	24	20	10	11	5	321

Table 2. *Distribution of different causes of injuries*

	Girls	Boys	Girls and boys
Collision	8	19	27
Falls	36	43	79
Games	16	36	52
Sports	15	75	90
Traffic accidents			
- bicycling	9	8	17
- other traffic accidents	5	1	6
Fighting	3	17	20
Other causes	3	4	7
Unknown	3	20	23
Total	98	223	321

Table 3. *Distribution of different causes in sports accidents*

	Girls	Boys	Girls and boys
Ice hockey	-	25	25
Bicycling (excluding traffic accidents)	2	16	18
Gymnastics	7	4	11
Swimming	3	10	13
Winter sports (excluding ice hockey and bandy)	2	4	6
Team games (excluding ice hockey)	-	11	11
Others	1 ^x	5 ^{xx}	6
Total	15	75	90

x = riding

xx = boxing, wrestling, field and track athletics

Bicycling was also a relatively frequent cause. The injuries caused by ice hockey and bicycling accidents were in the present material significantly more severe than injuries in other sports accidents. With severe injuries, treatment is more complicated than with slight injuries, and the occurrence of post-traumatic complications is also more frequent (7). Thus, the destructive effect of these accidents upon the dentition will be even more serious.

Because of the great variety of the causes of traumatic dental injuries, it is very difficult to prevent these happening; in many cases it is considered to be even impossible. However, a marked part of accidents causing dental injuries occurred in sports; especially in boys, about 50% of the sports accidents occurred in ice hockey and in other team games. The results of the use of mouth protectors in sports of this nature have been favourable (13, 15); in the material of Macko et al. (8) only a very low number of injuries occurred in organized sports. Thus, the best results in preventing traumatic dental injuries may be evaluated as being obtained in this class of accidents by the use of mouth protectors, not only in organized sports, but even in free time games.

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