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Pattern of traumatic dental injuries in children attending the University Dental Hospital, Sri Lanka

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Abstract –*Aim*: The aim of this study was to determine the pattern of traumatic dental injuries in children seeking care at the Division of Paediatric Dentistry, the Dental Hospital, University of Peradeniya, Sri Lanka. *Material and methods*: The sample consisted of patients attending the Division Paediatric Dentistry, University Dental Hospital for traumatic dental injuries between February 2003 and May 2006. The data were collected by means of an interviewer administered questionnaire to parent/guardian and a clinical examination. *Results*: A total of 197 children aged between 2 and 17 years had sought treatment for 304 traumatized teeth. Half of the patients had sought treatment more than 1 month after the trauma occurred. The most frequent cause for dental trauma was a fall (89%) whilst compromised aesthetics was the most common reason for seeking care (48%). Maxillary central incisors were the most affected teeth. Of the permanent teeth, 49% had sustained uncomplicated fractures involving only the enamel and dentine. Pulp therapy ranging from pulpotomy to root canal treatment was the treatment of choice for most of the traumatized permanent teeth (46%). In the deciduous teeth, a fracture involving enamel, dentine and the pulp was the most common (35%). *Conclusions*: As there was a considerable delay in seeking care for these injuries, it is recommended that educational programs be conducted for parents to create awareness about the importance of immediate management of traumatized teeth.

Traumatic injuries to teeth are a common problem especially among children. Epidemiological studies from various countries indicate that there is considerable variation in the prevalence of traumatic injuries to teeth. This has been attributed to factors such as the type of study, classification of dental trauma, and the dentition studied (1). Moreover, evidence suggests that the type of injury differs according to the dentition. Crown fracture without pulp exposure was the most common injury to the permanent dentition whilst in the deciduous teeth, luxation was the most common (1).

Traumatic injuries to teeth have a significant impact on the quality of life of children (2). Several studies have shown that the cost of treatment of traumatic injuries and their sequelae can be considerable to patients, insurance companies, and the public health services (3, 4). Therefore, the high frequency of occurrence of traumatic injuries to teeth in children could be of considerable concern to parents as well as dentists.

A review of the literature indicates that there are numerous studies on traumatic injuries to teeth. However, no published studies on dental trauma pertaining to the Sri Lankan population are available. Therefore, as a first step in obtaining such information, the present study assessed the pattern of traumatic dental injuries in children seeking care at the Division of Paediatric Dentistry, Dental Hospital, University of Peradeniya, Sri Lanka.

Material and methods

The present study was conducted at the Division of Paediatric Dentistry of the Dental Hospital, University of Peradeniya, Sri Lanka. All patients who sought treatment for traumatic dental injuries at the division during the period February 2003 and May 2006 were included in the study.

Data for the present study were collected from parent/guardian using an interviewer-administered questionnaire and a clinical examination. The questionnaire was used to obtain information about basic socio-demographic data and the history of dental trauma. With regards to the history, the following information was obtained: time and reason for the injury, time of first seeking care, time until the child came to the clinic, whether received injury to soft tissue and type of care provided immediately following injury. After administration of the questionnaire, a complete clinical examination was carried out. The following information was collected during the clinical examination: number of traumatized teeth and the type of tooth involved, type of dental trauma categorized according to the World Health Organization classification (5), and the

vitality of the traumatized tooth/teeth. Radiographs were also taken for all subjects. Treatment was planned and carried out based on the findings of the clinical examination. The administration of the questionnaire and the clinical examination were carried out by the second author. Stata 6.0 software (StataCorp LP, College Station, TX, USA) was used for data analysis.

Results

A total of 24,866 first visit patients attended the paediatric clinic between February 2003 and May 2006. Of these, 197 children (0.8%) sought treatment for traumatic injuries to their teeth. These children had sustained injuries to a total of 304 teeth of which 284 (93%) were permanent teeth. The results revealed that there was a considerable delay in seeking care following injury to teeth. Only 28% of children had sought care immediately or the day following the injury, while 25% had attended the clinic within a month after injury. The rest (47%) had sought care after 1 month. In fact, 12% had attended the clinic after a lapse of over 12 months. The main complaint of those who sought care for traumatic injuries was compromised aesthetics (45.7%), whilst 39.7% complained of pain/sensitivity.

Nearly 68% of the children who sought care for traumatic injuries were boys and the majority (55%) belonged to the 6–10-year-old age group (Table 1).

The distribution of the sample according to cause of injury is shown in Table 2. Eighty-nine percent had sustained injuries to their teeth as a result of a fall. This was followed by 7% of children traumatizing their teeth as a result of sports related injuries. Nearly 51% and 46% had sustained injuries to one tooth and two teeth, respectively. Injuries to soft tissues were reported by 14% of the sample. In the permanent dentition, the upper left central incisor was the most commonly affected tooth (48%) followed by the upper right central incisor (44%) (Fig. 1). The upper right central incisor

Table 1. Distribution of the sample according to age and gender

	Boys		Girls	
Age group (years)	*n*	%	*n*	%
2–5	8	87.5	1	12.5
6–10	66	61.1	42	38.9
11–17	59	73.8	21	26.2
Total	133	67.5	64	32.5

Fisher's exact test = 5.31, $P = 0.07$.

Table 2. Distribution of sample according to cause of injury

Cause of injury	*n*	%
Fall	176	89.4
Assault	2	1.0
Road traffic accident	3	1.5
Sports related injury	14	7.1
Others	2	1.0

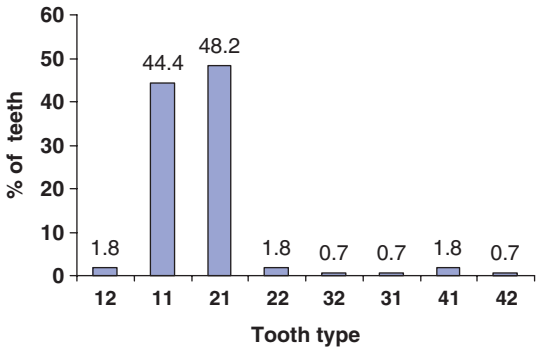

Fig. 1. Distribution of traumatized permanent teeth according to tooth type.

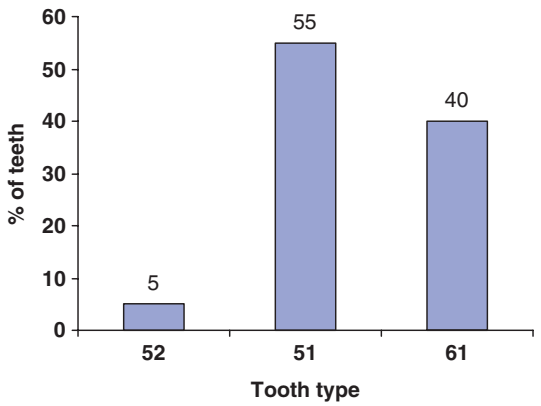

Fig. 2. Distribution of traumatized deciduous teeth according to tooth type.

was the most commonly affected tooth in the deciduous dentition (55%) (Fig. 2). Fracture of crown was the most common injury to both permanent and deciduous teeth. Of the 284 traumatized permanent teeth, 49% had enamel-dentine fractures and nearly 35% had a fracture involving enamel, dentine, and the pulp. Of the 20 traumatized deciduous teeth, 35% had enamel-dentine fractures with pulpal involvement and 25% had enamel-dentine fractures without pulpal involvement (Table 3). The majority of traumatized permanent teeth required

Table 3. Distribution of traumatized teeth according to type of injury and type of dentition

	Permanent teeth (284)		Deciduous teeth (20)	
Type of injury	*n*	%	*n*	%
Crown fractures				
Enamel only	6	2.1		
Enamel and dentine only	140	49.3	5	25
Enamel, dentine and pulp	98	34.5	7	35
Crown and root	1	0.3		
Root only	7	2.5		
Concussion	11	3.9	4	20
Subluxation	1	0.3	2	10
Luxation	9	3.2	1	5
Avulsion	11	3.9	1	5

Table 4. Distribution of the type of treatment required for traumatized teeth according to type of dentition

	Permanent teeth (284)		Deciduous teeth (20)	
Type of treatment	*n*	%	*n*	%
Review only	9	3.1	4	20.0
Composite restoration	122	43.0	3	15.0
Root canal therapy	90	31.7	4	20.0
Splint & root canal therapy	13	4.6		
Pulpotomy	27	9.5		
Extraction	–		7	35.0
Dical and GIC restoration	8	2.8	2	10.0
Splint only	8	2.8		
Implantation of tooth	5	1.8		
Prosthesis	2	0.7		

pulp therapy (46%) ranging from pulpotomy to root canal treatment. Extraction was the treatment of choice for 35% of traumatized deciduous teeth (Table 4).

Discussion

In the present study, only 0.8% of children who attended the paediatric dental clinic of the University Dental Hospital during a period of 40 months had sought care for traumatic injuries to their teeth. This figure may not indicate that traumatic injuries to teeth in Sri Lankan children are low. But it is possible that many who sustained injuries to their teeth did not seek care because of the absence of symptoms. In fact, in some societies, fractures to teeth are not taken seriously and those who sustain dental trauma do not seek care until they develop acute symptoms (6).

The present study also found that traumatic injuries to teeth were more common among boys than girls and is in conformity with findings from other studies (6, 7). This may be because of the fact that boys are more involved in rigorous physical activity than girls. In addition, dental injuries were most common in the 6–10-year-old age group. Comparison with earlier studies is difficult, as there are large variations in the age groups that have been considered. Nevertheless, findings from many studies on traumatic injuries in children presenting at health centers suggest that such injuries are most frequent in children between 6 and 13 years of age (7, 8).

The main cause of injury to teeth was because of a fall and is in agreement with other studies on dental trauma in children presenting at paediatric clinics (6–9). There is no doubt that prognoses of many types of traumatic dental injuries depend on prompt management. However, in accordance with other studies (9–11), the percentage of children who sought care immediately or the day following the injury was low (28%). This shows that many parents lack knowledge about the importance of obtaining immediate care following dental trauma. Moreover, availability and accessibility of dental services may also be contributory factors for the delay in seeking care.

Only 14% of children had sustained soft tissue injuries. There is a possibility that recall bias may have influenced this result. As the time lapse between injury and presentation for care was considerably long for a majority of children, it is possible that these children as well as their parents may not have been able to recall precisely what happened at the time of injury. Findings from other studies also indicate that only around 14–18% of children with dental trauma had sustained injuries to their soft tissues as well (11, 12). In both deciduous and permanent dentition, the central incisors were the most commonly traumatized teeth. This supports the findings of Sandalli et al. (7) and Kargul et al. (8). When compared with other teeth, the central incisors may be more susceptible to traumatic injuries because of their position in the dental arch. Moreover, these teeth may have been protruded in some children, thus making them vulnerable to injury. It is well-established that increased incisal over-jet increases the risk of traumatic injuries to teeth (13, 14).

The most common type of dental injury observed among children with permanent teeth in this study was a fracture of both enamel and dentine without the involvement of the pulp. Similar findings have been reported in other studies (6, 15). In deciduous teeth, a fracture involving enamel, dentine and pulp was the most common. This is in contrast to many studies which have shown that luxation was the most common type of injury in the deciduous teeth (6, 7, 16, 17). In addition, most of the traumatized permanent teeth (46%) required pulp therapy ranging from pulpotomy to root canal treatment as the treatment of choice. This included 12% of teeth with uncomplicated fractures. It is noteworthy that all children who required pulp therapy for these uncomplicated fractures had considerably delayed obtaining dental care. It is possible that these teeth may not have developed pulpal complications, if these children had sought treatment early.

In conclusion, it was evident from this study that there was a considerable delay in obtaining dental treatment following traumatic dental injuries. Thus, educational programs directed at parents should be conducted to create awareness about the importance of immediate management of traumatic dental injuries, which will entail better prognosis of traumatized teeth.

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