Epidemiology of traumatic injuries to the permanent incisors in a school Population in Sana'a, Yemen

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Abstract

This cross-sectional survey was carried out to assess epidemiological data concerning dental injuries to the permanent incisors of Yemeni children. It included 612 boys and 563 girls represented a normal ethnic and socioeconomic distribution for the area. The prevalence, relationship to gender, pattern of involvement, degree of injury and the causative factors for traumatized permanent teeth were studied in a school population. The prevalence was found to be 3.8% with a ratio of 1.3 boys to 1 girl. The most prevalent fractures were found from the enamel. Though most of these fractures were aesthetically unsatisfactory, a high proportion of them were not treated. The most common causative factor was minor outdoor accidents. It was concluded that, traumatic dental injury may pose a serious dental public health problem. Great attention should be gain by parents, teachers and the school heath team for the need of early professional attention.

Introduction

A traumatic injury to the tooth and supporting tissues can be a tragic experience for the young patient. This is not an unexpected phenomena. A number of factors need to be taken into account when assessing whether or not a condition is a public dental health problem. The condition should be wide-spread in a population; it may be life-threatening or have a significant impact on individuals and society and the management of such a case is a problem that requires skill, experience and judgement.

Meon (1986), suggested that the incidence of trauma to the traumatized incisors varies with age, sex and population sample.

Epidemiological study concerning dental injuries to the permanent incisors of Syrian children was carried out by Marcenes et al (1999), they reported that, The prevalence of traumatic injuries to the permanent incisors rose from 5.2% at the age of 9 years to 11.7% at the age of 12 years (P = 0.007). The

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difference in prevalence between boys and girls was not statistically significant (P > 0.05).

Bastone et al (2000), reviews recent reports describing the aetiology of dental trauma from national and international studies as well as the different classifications currently used to report dental injuries. Reported studies demonstrate that males tend to experience more dental trauma in the permanent dentition than females. The most frequent type of injury was a simple crown fracture of the maxillary central incisors in the permanent dentition.

Adekoya et al (2005) found that, the prevalence of dental injuries was 9.1%. Boys sustained more injuries than girls with a ratio of 2:1 in Nigerian Adolescents. The dental injuries were almost entirely restricted to the maxillary central incisors (75 %). Single tooth injury was predominant in all age groups. The commonest type of injury was uncomplicated crown fracture (57.4%). The commonest cause of injury was fall (42.6%).

In this study, the occurrence of tooth fractures in schoolchildren in Sana'a, Yemen had been studied retrospectively. The purpose was to determine the prevalence of trauma to the permanent anterior teeth, its relationship to sex, the pattern of involvement, the degree of injury and the common aetiological factors.

Method

A cross sectional survey (n-1,175) of traumatic dental injuries among 7 to 18 - year-old from a primary and secondary schools in Sana'a, were examined. The children, 612 boys and 563 girls represented a normal ethnic and socioeconomic distribution for the area. Local authorities including the Education Council provided the names and addresses of all the schools in the city.

The children were invited to participate in the study. A letter was sent to the parents of the children explaining the aim, characteristics and importance of the study, and asking for their participation. Parents who agreed that their children could participate signed a consent form. Parents were assured that children who opted not to participate would not suffer any consequences.

Dental examinations were carried out and questionnaires were administered by a single examiner. The examinations were performed under natural light. Strict cross infection control measures were adopted. The examiner used disposable gloves. Packages with plane mirrors, community periodontal index (CPI) periodontal probes and gauze pads were sterilized in sufficient number for a single day's work. Dental examinations included only upper and lower incisors and adjacent soft tissues. Only children with at least one permanent incisor erupted were included in this study. A radiographic examination was not carried out. Hence injuries recorded were limited to those in which clinical evidence of damage was evident. The sex and age of every participant were recorded. The number of traumatized teeth per participant, the teeth traumatized, the cause and extent of injury and the treatment given were registered for all injured participant. The criteria adopted for traumatic dental injuries were those used by (WHO) World

Health Organization Elisa et al (2000). The traumas were classified as:

a) Enamel involvement only.
b) Enamel and dentine without pulp involvement.
c) Enamel, dentine and pulp involvement.
d) Exarticulation.
e) Displaced teeth.

The etiological factors recorded were divided into three main groups. The three groups were motor-vehicle accidents, sports and normal childern's activities.

Results

The prevalence of traumatic injuries in permanent incisors for the population sample was 3.9%. Boys were more prone to trauma compared to girls. 4.6% of the boys and 3.2% of the girls had one or more restored or unrestored traumatized anterior teeth. This represented one traumatized anterior teeth for every 21.85 boys and one traumatized anterior teeth for every 31.28 girls giving a ratio of 1.4:1 (Table 1).

Table 1
Distribution of Children with traumatized anterior teeth according to gender.

Gender / involvement	Males		Females		Total	
	No.	*%*	*No.*	*%*	*No.*	*%*
Examined	219		203		422	100
Traumatized	63	28.8	43	21	106	25.1

Table 2 shows the distribution of traumatized teeth. The maxillary central incisors accounted for 89.1% of teeth affected. The maxillary lateral incisor and the lower anteriors had a lower frequency of trauma.

Table 2
Distribution of Traumatised Teeth

	Central incisor	Lateral incisor	Canines
Maxillary			
Mandibular			

	Maxillary			Mandibular			Total
Teeth	1/1	2/2	3/3	1/1	2/2	3/3	
Number							
Percentage							

	Maxillary			Mandibular			
Teeth	1/1		2/2	1/1	2/2		Total
Number	49		3	2		1	55
Percentage	89.1		5.5	3.6		1.8	100

Table 3
Distribution of Children by number of Traumatised Teeth

No. of Traumatised Teeth/child	*One*	*Two*	*More than two*
No. of Children	37	9	0
Percentage	80.4	19.6	0

Table 4
Distribution of Traumatised Teeth According to Severity and Treatment

Tooth Involvement	*Traumatized Teeth*	
	No.	*%*
Enamel only	25	45.5
Enamel and dentine	25	45.5
Enamel, dentine and pulp	3	5.4
Exarticulation	2	3.6
Total	55	100.0

Most of the children with traumatized teeth had only one tooth injured (Table 3). None of the children had 3 or more teeth traumatized. The types of trauma which the teeth had suffered were coronal fractures and exarticulations. The most common type of trauma was the uncomplicated crown fracture. Forty-five and a half per cent of the trauma

cases showed involvement of the enamel only, 45.5% involvement of the enamel and dentine and 5.4% involvement of the enamel, dentine and pulp (Table 4). Only 3.6% of the traumatized teeth were exarticulated.

The etiology of traumas is shown in Table 5. The majority of the trauma cases were observed to be a result of a fall which occurred while participating in typical children's activities. These activities were random play rather than organized sports. Other less common aetiology, were indoor and motor-vehicle accidents.

Table 5
Distribution of Traumatised Children According to Aetiology

Aetiology	*No. of Children*	*Percentage*
Outdoor children's activity	37	80.4
Organized Sports	2	4.4
Motor Vehicle Accidents	1	2.2
Unknown	6	13.0

Discussion

The prevalence of traumatized anterior teeth seen in this study is 3.9% and it is lower than those reported by Macko et al, Andreasen et al, O'Mullane and Jarvinen. It closely approximates the findings of Grundy, Ellis and Zadik (Table 6). This study waas cross-sectional and retrospective in nature and it only allowed the recording of fractures and exarticulations of teeth accurately. Other injuries such as tenderness, mobility or injury to periodontal tissues can only be recorded if seen immediately. Pulpal involvement, like loss in vitality but without any clinical signs and symptoms can only be detected with the aid of a radiograph and vitality test. Therefore, it is likely that these factors and the different examination method and materials used accounted for the low prevalence of traumatized anteriors seen in this study.

Table 6
Comparison of Studies of Anterior Tooth Fracture

Study	*Sample Size*	*Age*	*Trauma*		
			Prevalence	*Ratio*	
				Male	*Females*
Grundy (1959)	652	5-15 yrs	5.9%	2.5	1
Ellis	4.251	Secondary school Children	4.2%	2.5	1
O'Mullane (1972)	2.792	6-19 yrs	12.8%	1.5	1
Andreasen el al (1972)	487	9-17 yrs	22.0%	1.4	1
Zadik et al (1972)	10.903	6-14 yrs	8.7%	1.3	1
Macko (1979)	1.314	12-15 yrs	19.1%	1.9	1
Jarvinen (1978)	1.614	6-12 yrs	19.8%	1.7	1
York et al (1978)	430	11-13 yrs	16.7%	1.2	1
Meon (1986)	1.175	7-12 yrs	3.9%	1.4	1
Present Study	422	6-18 yrs	4.7%		

This study confirms the fact that boys are more prone to trauma than girls, the ratio being 1.4:1. The teeth involved and their distribution are in agreement with earlier studies (Grundy, 1959; Zadik et al, 1972, Jarvinen, 1978 and Andreasen et al 1972).

The more common types of fractures were fracture of the enamel only and fractures of enamel and dentine. None of the enamel fractures had received treatment. Only 20.0% of the children with enamel and dentine fracture had received first aid or restorative treatment. None of the children who had not received treatment complain of any discomfort or pain or poor cosmetic effect due to loss of tooth substance. Even though some of these fractures were aesthetically unacceptable they were well tolerated. It thus appear that pain

and not aesthetic was the reason for the child to seek treatment. It also suggests that psychological and emotional problems do not necessarily result from trauma of anterior teeth.

A study of the aetiology of trauma in the present study showed that the majority of trauma resulted from minor accidents during outdoor activity. It is interesting to note that only 2 out of the 37 minor outdoor accidents occurred during organized sports. In previous studies it was suggested that organized ports accounted for a majority of dental trauma (Kramer, 1941; Ravn, 1974); this is some thing that the present study failed to corroborate. The difference could be explained by the fact that in this country organized contact sports are not commonly played in primary schools. These findings suggest that the introduction of prophylactic measures during sports could do very little in reducing the occurrence of traumatized anterior teeth in primary school children in this study.

Conclusion

Traumatic injuries to the permanent anterior teeth of children are relatively common. Even though most of the injuries are apparently slight, it can lead to real problems if not treated early. More emphasis must be placed on these problems in the school dental services and parents, teachers and the school health team should be made aware of the need for early professional attention.

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