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Traumatic Dental Injuries Among 6 – 13 – Year - Old - School Children in Tikrit City

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Abstract

Background: An injury to both primary and permanent teeth and the supporting structures is one of the most common dental problems seen in children. The extent of injury may vary from mild chipping of enamel to sever maxillofacial injury.

The aim of this study was to find out the prevalence of traumatized anterior teeth among primary school children.

Materials and methods: This study is a cross-sectional survey was carried out through clinical examination of anterior teeth among 720, 6-13 year old children enrolled in primary public schools of tikrit city. The prevalence of traumatized anterior teeth was studied in relation to age, gender, type of injury in addition to the cause of fracture. Recording and diagnosis of dental fracture were assessed according to Garcia-Godoy classification.

Results: Males were more affected than females with odds ratio was 2.53 and statistically was significant. The higher prevalence of dental trauma was recorded among the age 10-11 year old. The permanent maxillary central incisors were the most frequent injured tooth and the most frequent type of fracture was the Class II Enamel-Dentine, fracture without pulp exposure. Fall and playing were the most frequent causes of dental injury.

Conclusion: data of the present study clearly show the need for dental health education of children and their parents, so prevention programs are needed to improve the dental health of Iraqi children.

Keywords: prevalence, dental trauma, enamel-dentine fracture.

Introduction

The tooth injury defined as damage to the tooth when excessive force is placed on it [(1)]. A tooth injury is a fracture, luxation or avulsion, although a combination of injuries may occur in the tooth [(2)].

There is perhaps no single disturbance that has greater psychological impact on both the parents and children than the loss or fracture of a child's anterior teeth. This is especially so if the injury affects the permanent dentition and involves the loss extensive tooth structure. Traumatic dental injuries involving the anterior teeth may not only lead to restriction in biting, phonetics and aesthetics, but may have an impact on a child's personality and quality of life [(3)], since these fractures may alter the child's appearance and target for teasing and ridicule by other children [(4, 5)]. Dental injury of primary teeth has been found to be responsible of complicated problems to underlying permanent teeth such as; hypoplasia,

discoloration, delays in eruption time and tooth malformation [6] also malocclusions may occur in a short time due to the loss of proximal and incisal contact [7], while tooth loss in 12 year olds is significant because the dentition is still developing and any disruption will affect the development of the arch, occlusion and patient's aesthetic [8].

The assessment of traumas in primary dentition seems to be very relevant not only because of the presence of sequelae in the present dentition, but also because it allows the identification of possible development alterations in the permanent dentition. Unfortunately, people in general are not well informed about the risks of trauma in the deciduous and permanent dentitions and what can be done to avoid them [9]. Epidemiological study showed that approximately 30% of all children under the age of seven have sustained injuries to one or more of their primary incisor [10]. In the United Kingdom, the prevalence of injury to teeth among children increased from 6% at 6 years-old children to 19% at 13 years-old children, while in the United States, the prevalence of injuries among 6-20years-old was 18.4%[11]. In Iraq, many studies were conducting concerning the prevalence of traumatic dental injuries [12, 13, 14, 15, and 16].

The prevalence of dental trauma in various epidemiological studies has also been found to differ considerably. The great variation may be due to a number of different factors such as the trauma classification, the dentition studies, geographical and behavioral differences between study location and countries [17].

The etiology of trauma can be categorized into: (1) domestic violence-child abuse and neglect. (2) Sporting activities-contact sport, bicycle or horse riding. (3) Other road accidents, falls or collisions, handicapped children [4, 18]. Injury to the dentition can be due to direct which occurs when the dentition is struck directly be one of subjects such as a hard ball, or indirect when blow to the chin may cause sudden forceful closure of mandibular teeth with their maxillary opponents, as may follow a fall, a fight or road accidents[19].

Onetto et al 1994 reported that 10-12 year old children had the highest number of injuries and falling was the most common cause of injury in both primary and permanent dentition groups, followed by striking against object and bicycle accidents in permanent dentition[20]. Iraqi studies also discussed this subject and found a significant increase in the prevalence of trauma associated with advancing age children. At age of one year, 17.3% of children were with traumatized teeth increased to 34% and 41% in 2 and 3 year of age respectively[21], While El-Samurai 1989 showed no significant difference between four and five year old children [22].

Materials and methods

A random sample of 720 school going children aged 6-13 year-old were selected from different primary schools located in tikrit city and the survey was conducted during the period between the beginning of at October 20013 and the end of April 2014. The children with history of systemic diseases like epilepsy or handicapped which may affect the result were excluded. Oral examination to identify the type of the traumatic injury was performed in classrooms under natural light and because the radiographic examination was not performed; root fractures were not recorded. The assessment was recorded according to the criteria of Garcia-Godoy 1981[23]. A tooth that

showed more than one type of injury was recorded once according to the highest score. The statistical package for social sciences (SPSS, version 18) was used for data entry and analysis. Chi ($\chi 2$) square test of association was used to compare proportions of different factors among different groups of study sample. Odds ratio (OR) was used to identified the risk. P value of ≤ 0.05 was regarded as statistically significant. Tables used to present the data.

Results

The distribution of the total sample by age groups and gender was shown in table (1). The prevalence of traumatized children was found to be 71 (9.9%), versus the normal 649 (90.1%) of the total sample examined. According to the gender, the prevalence of fractured anterior teeth among males (56, 12.6%) was higher than found among females (15, 5.4%), with ratio was 2.53, this relation was statically significant p value < 0.05 (X2 = 10.012, df =1). The most affected age group was 10-11 years and the relation was statistically significant, while the lowest age group with traumatized children was 6-7 years with statistically significant relation, as show in table (2).

The most common fractured teeth was permanent upper central incisor, followed by deciduous upper central incisor and the lowest fractured teeth was the permanent upper lateral incisor for the total sample as shown in table (3). The most frequent type of fracture was class II enamel and dentine fracture without pulp; this relation was statistically significant p value < 0.05 (X2 = 14.08, df = 5), as shown in table (4). For the total sample, dental trauma due to falls tended to be the more frequent than the other causes of traumatic teeth 40 (56.3%) followed by playing football 12 (16.9%), while the lowest cause was road accident 4 (5.6%).

Discussion

This cross-sectional study is the first investigation to assess the dental trauma to the anterior teeth of primary school children in tikrit city. The prevalence of trauma in the current study was recorded to be about 9.9%. This was higher than reported by other studies [24, 25]. The prevalence in this study was lower than other studies [26, 27]. Also the prevalence was higher than other Iraqi studies regarding anterior teeth fracture as Baghdadi [28] and Noori [15]. The behavioral and cultural diversity may explain differences in findings between countries as well as within a country. Variations in sampling and diagnostic criteria between different studies also explain differences in finding [29].

Concerning gender variation in relation to traumatic dental injury, this study revealed that males were significantly affected by dental trauma compared to females. This result is in agreement with many studies [30, 31, 32], while it is disagreement with other studies [22, 33, 34]. Result also showed that males were more affected than females in all age group; the reasons for this gender difference may be due to the fact that males tend to be more active and participate in strenuous activities with higher trauma risk, such as contact sports and more aggressive types of playing. Whereas females tend to be more mature in their behavior and may be more concerned about their physical appearance and aesthetics which possibly reflects the play characteristics of females toward more stability and calmness than males, as well as one can assume that mother were more concerned about the esthetic of their female daughters than

males, seeking dental treatment quickly after injuries [35].

Maxillary central incisors were the most common teeth affected by dental trauma. The same result was recorded by others studies [22, 34, 36]; this may be explain by the fact that the prominent and vulnerable position of the maxillary incisors in the face was responsible for their more frequent involvement in fractures than other teeth [37]. This study was agree with other result concluded that enamel and dentine fracture was the most common type of injury recorded [8, 14, 31] and disagreement with other studies which concluded that simple enamel fracture was the most common type [22, 28, 30, 34].

Conclusion

The prevalence of traumatized anterior teeth in children was founded to be 71 (9.9%) of the total sample examined. Boys more affected than girl with ratio 2.53 and the difference was statistically significant. The most affected teeth by dental trauma were found to be the maxillary central incisors for the permanent and the lowest teeth were the upper permanent lateral incisor. Enamel-dentine fracture was found to be the most common type of dental injury and the differences was statistically significant, followed by simple enamel fracture and fall was the most common cause of dental fracture.

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Table (1) the distribution of the total sample according to the age groups and gender.

Age group years	Males		Female		Total	
	No	%	No	%	No	%
6-7	75	19.5	56	20.2	141	19.6
8-9	108	24.4	78	28.2	186	25.8
10-11	168	37.9	103	37.2	271	37.6
12-13	82	18.5	40	14.4	122	17
total	443	100	277	100	720	100

Table (2) the distribution of study sample according to fractured teeth, age groups and gender.

P value	Total		Gender				Age group	
			Female		Male			
	%	No	%	No	%	No		
< 0.05 Significant	1.5	11	0.4	1	2.3	10	Fracture	6-7
	18.1	130	19.9	55	16.9	75	Normal	
> 0.05 Non significant	2.1	15	1.8	5	2.3	10	Fracture	8-9
	23.8	171	26.4	73	22.1	98	Normal	
< 0.05 Significant	4	29	1.4	4	5.6	25	Fracture	10-11
	33.6	242	35.7	99	32.3	143	Normal	
> 0.05 Non significant	2.2	16	1.8	5	2.5	11	Fracture	12-13
	14.7	106	12.6	35	16	71	Normal	
< 0.05 Significant	9.9	71	5.4	15	12.6	56	Fracture	Total
	90.1	649	94.6	262	87.4	387	Normal	
	100	720	100	277	100	443	Total	

Table (3) the distribution of study sample according to the fractured teeth and gender.

Total		Gender				Fractured teeth
		Female		Male		
%	No	%	No	%	No	
90.1	649	94.6	262	87.4	387	Normal
0.7	5	0.4	1	0.9	4	Upper primary central incisor
8.2	59	4.3	12	10.6	47	Upper permanent central incisor
0.4	3	0.4	1	0.5	2	Upper and lower permanent central incisor
0.4	3	0.4	1	0.5	2	Lower permanent central incisor
0.1	1	0	0	0.2	1	Upper permanent lateral incisor
100	720	100	277	100	443	Total

Table (4) the distribution of study sample according to the type of fracture and gender.

Total		Gender				Type of fracture
		Female		Male		
%	No	%	No	%	No	
90.1	649	94.6	262	87.4	387	Normal
2.1	15	2.2	6	2	9	Cl I
5.3	38	2.5	7	7	31	Cl II
1.3	9	7	2	1.6	7	Cl III
0.1	1	0	0	2	1	Displacement
1.1	8	0	0	1.8	8	Avulsion
100	720	100	277	100	443	Total