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Traumatic Dental Injuries among 8-12 Year Old Sudanese Children in Khartoum State

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Abstract: Background: Traumatic dental injuries are common in children, and they are often associated with facial fractures in road traffic accidents. Boys sustain dental trauma almost twice as much as girls. The aim of this study is to determine the prevalence of traumatic dental injury among 8-12 years old Sudanese children. Materials and Methods: A cross sectional school based study for 813 school children (395 boys and 418 girls) 8-12 years old were selected from private and public primary schools for assessment of traumatic dental injuries according to Ellis classification and the causes of trauma were studied. Data was collected by visual examination and no radiographs were taken. Chi-square test was used to test association between the different variables. P-value < 0.05 was considered statistically significant. Results: High prevalence (27.9%) of traumatic dental injuries was observed in this study. Boys and girls were more or less equally affected (48.6%, 51.4%) respectively. Falling was the most common cause (14.1%) while the least common one was road traffic accidents (0.6%). Tooth fracture was the most frequent type of tooth injury reported in the current study (13.3%). Conclusion: The prevalence, type and most common causal factors of traumatic injuries to the maxillary anterior teeth in Sudanese schoolchildren 8-12years old was approximately the same as that found in other countries.

Keywords: Traumatic dental injuries; Prevalence; Anterior teeth; Children.

1. Introduction

Traumatic dental injury (TDI) is a serious problem affecting young children and by time, its incident will exceed that of dental caries [1]. Dental trauma affects the different layers of the tooth structure depending on the force of trauma, and it might be followed by pulpal hyperemia, congestion and alteration in the blood flow of the pulp which is sufficient to initiate irreversible degenerative changes that may lead to pulpal necrosis. In addition, the apical vessels may be damaged enough to interfere with reparative process. on the other hand, traumatic dental injuries may be serious enough to cause maxillary and mandibular fractures. [2]

The seven-to-twelve year age group is considered to be the most prone age to any form of dental trauma. Furthermore, boys sustain dental trauma almost twice as much as girls, exhibiting significant gender differences with regard to dental trauma experience. [3]

Causes of traumatic dental injuries were studied. In girls, the most common cause was falls, and with boys were sports. Bicycling was also a markedly frequent cause of trauma for boys. [4]

There are numerous classification systems currently available for TDI, Anderasen's classification, the WHO classification, Gracia- Godoy's classification and Ellis classification [5].

Traumatic dental injuries can be highly challenging to be treated, because clinicians often rely on dentists to treat them. However, many clinicians work in a community- based environment where there is no dentist on call for emergencies. Treatment of traumatic dental injuries depends on many factors such as type of tooth involved (primary or permanent), nature of the injury, length of time from injury to treatment, how the tooth was cared for after the injury and some patient's factors such as age and medical fitness of the patient. [6, 7].

To our knowledge no published study concerning the prevalence of dental trauma in the anterior teeth among the Sudanese school children. Therefore this had been carried to determine the prevalence of traumatic dental injuries among the school children in Khartoum state capital of Sudan as a base line for further studies in different areas and age group of Sudanese population.

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2. Materials and Methods

The sample consisted of 813 children (395 male and 418 female) selected from private and public primary schools in Sahafa locality, Khartoum state, Sudan. Age of the examined students ranged from 8-12 years old. Consent from university of Medical Sciences and Technology (UMST) was obtained to the Minister of Education. Then, an ethical clearance was conducted from the minister of education to the head principles of the randomly selected private and public primary schools and the purpose of the study was explained. A student's name list was obtained from the head master of the selected schools in order to check the interviewed students and permission from the students' parents was taken. Then, the aim of the study was explained to the students in the school classes. All the students aging 8-12 years old were examined under day light in an ordinary chair in one of the teacher's offices. The data sheet was filled for those with history of trauma to the anterior segment. Type of trauma according to Ellis classification was checked out along with the cause of trauma. Only three of the Ellis classification was used in the current study. One of the main difficulties facing this study was the radiographic examination due to many issues we faced including the negative response of the parents when they are asked to leave their children to join the doctor for the radiographs because of the long distance transport required for the radiograph taken, as the majority of radiographic centers far from the schools.

Therefore, we decided to carry out the primarily study using clinical inspection through day light to have overall prevalence of crown fracture, displacement and total tooth loss in addition to the etiological factors, hoping for a bright future to carry such studies with more information and details.

3. Statistical Analysis

Data were collected, summarized, cleaned and coded; then entered to the Statistical Package for Social Sciences (SPSS) program using version 17, Chi square test was used P-value of less than 0.05 was considered as significant. Results were presented and tables.

4. Results

The total number of the examined students in this sample was 813, 48.6% boys and 51.4% girls. The visited schools were private and public primary schools. The study showed that boys and girls had more or less equal percentage of trauma 27.6% and 28.2% respectively.

Table-1. Percentage of examined students with a history of trauma (%).

History of trauma	Boys (%)	Girls (%)	Total (%)
Yes	109 (27.6)	118 (28.2)	227(27.9)
No	286(72.4)	300 (71.8)	586(72.1)
Total	395(48.6)	418(51.4)	813(100)

The most common type of tooth injury in both genders was studied. Tooth fracture and tooth loss were found to be higher in boys (14.9%) than girls (11.7%) respectively, while displaced tooth was observed to be more in girls (10.3%) than boys (6.3%), and there was no significant difference Table 2.

Table-2. The most common type of tooth injury among the children.

Type of trauma	Boys (%)	Girls (%)	Total (%)
Crown fracture involve enamel and dentine	59 (14.9)	49 (11.7)	108 (13.3)
Total tooth loss	28 (7.2)	38 (9.1)	66 (8.1)
Displaced tooth without fracture of crown or root	25 (6.3)	43 (10.3)	68 (8.4)
No trauma	283 (71.6)	288 (68.9)	571 (70.2)
Total	395 (100)	418 (100)	813 (100)

The most common cause of traumatic dental injuries was found to be falling and playing football which were higher in girls (17.7%) (3.8%) than in boys (10.4%) (2.8%) respectively, while fighting occurred almost twice in boys (3.8%) as girls (1.7%), however there was no significant difference Table 3.

Table-3. Causes of tooth fracture among the children.

Cause of trauma	Boys (%)	Girls (%)	Total (%)
Playing foot ball	11(2.8)	16(3.8)	27(3.3)
Falling	41(10.4)	74(17.7)	115(14.1)
RTA	5(1.3)	0 (0)	5(0.6)
Fighting	15(3.8)	7(1.7)	22(2.7)
Others	36(9.1)	14(3.3)	50(6.2)
No trauma	287(72.7)	307(73.4)	594 (73.1)
Total	395(100)	418(100)	813 (100)

4. Discussion

The current study is a cross sectional, school-based study, to determine the prevalence, cause, common types of traumatic dental injury in the anterior teeth, for a sample of Sudanese school children in Khartoum, the prevalence of dental trauma was reported (27.9%) more or less similar among genders.

Traumatic dental injuries have been reported as a common dental problems, in many countries around the world within the past 25 years. [2-4, 8-29] The prevalence was well documented in the literature among different populations, it range from 5.1% to 33% [3-10, 15-17, 19, 21-25, 28].

In this study, the prevalence of traumatic dental injuries was reported (27.9%). Similar results were obtained in previous studies carried out within different countries [12, 22, 29] However, less percentage (9.1%) was reported among the same age group Sudanese school children in Wad-Madani locality. [30] Whereas among Sudanese Visually impaired individual in Khartoum state much high prevalence were reported (32.6%). [31]

In African country Nairobi dental trauma was reported (16.1%) by Marjorie Muasya for 12-15 years old children which less compared to current study. [11] and in Southern Brazilian 12 years old children (17.3%). [23] Moreover, (14.5%) were observed by RohiniDua and Sunila Sharma among the children of Derabassi of 7-12 years old, [3] and in Jordan by Rajab LD. [21] Much higher result was reported among 5-6 and 12-14 year old Saudis boy in Riyadh (33%). [19]

This variation in the prevalence of traumatic dental injuries can be partially attributed to the difference in the study age group, the size of study sample, and the type of sport among different countries and populations. As well as the methods for appraise the tooth fracture.

In contrast, much lower percentages of traumatic dental injuries were reported earlier by Baghdady VS, Ghose LJ, Enke H among Iraqi and Sudanese children (7.7%) and (5.1%) respectively. [16] Similar result (5.2%) was obtained by Marcenes W, al Beiruti N, Tayfour D, Issa S among 9 -12 school children in Damascus, Syria, [17] and in South Africa by Naidoo S, Sheiham A, Tsakos G showed close results (6.5%). [25]

In the present study, the most common etiological factor of traumatic dental injuries was found to be falling (14.1%) in both public and private schools. A similar etiological factor had been as well reported in previous studies within different countries as fall down the main causes. [3, 18, 19, 21, 24, 25]

In contrast, the study conducted by Jarvinen S. among the Finnish children reported that the proportion of the severe injuries was significantly higher in ice hockey and bicycling accidents than in other sports accidents. [4] Whereas, in Syria observed that the most common cause was violence with a percentage of (42.5%). [16] While in Southern Brazil, collisions mainly with doors was found to be the most prevalent causative factor of traumatic dental injuries. [22]

In the current study, the most common type of tooth injury was found to be tooth fracture (13.3%). The same result was obtained by Zerman N and Cavarelli G among the population of Italy. Also, a study carried out among 12 years old school children of South India found out that the most common type of tooth injury was uncomplicated crown fracture [14, 15]. Same results were obtained in previous studies and surveys. [20, 22, 24, 26] However, luxation and complicated crown fracture was reported to be the most common cause of traumatic dental injuries in a study carried out in Saudi Arabia. [19]

In most of the previous studies, males had higher prevalence of traumatic dental injuries than females [3-10, 15, 16, 18, 21, 23-25]. In contrast, the present result showed that both genders had similar incidence of traumatic dental injuries. On the other hand, there was no significant difference of traumatic dental injuries between boys and girls in the study carried out in Damascus, Syria [17]. This may be due to the small size of the study sample and difference in the age group.

The difference regarding the cause of traumatic dental injuries among populations in different countries may be referred to the life style among different populations as well as the wide range of the study age group. In Sudan, the sport activities are limited, and most common activities are out door playing of the traditional games and football in non- grassed ground. Whereas in more developed countries, numbers of well- organized sports are available at school ground and clubs such as swimming, hockey, football…etc.

5. Conclusion

In conclusion, traumatic dental injuries seem to be serious dental public problems among Sudanese school children. Accordingly, there is a great need to carry out more comprehensive studies for a larger sample size in different areas and among different age groups in order to acquire a more comprehensive representation of the dental trauma and associated risks factors and to raise the dental awareness among the students and parents.

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