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Assessment of the prevalence of Traumatic dental injuries (TDIs) to permanent incisors in school going children

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Abstract

Background: The prevalence of traumatic dental injuries (TDIs) to anterior teeth among schoolchildren has been studied in different parts of the world by many researchers, and a wide range of variation has been found. In Asia and Africa, the prevalence of TDI to anterior teeth among adolescents ranges from 4% to 35% and 15% to 21%, respectively. In America and Europe, the prevalence varied from 15% to 23% and 23% to 35%, respectively.

Aim of study: To assess the prevalence of Traumatic dental injuries (TDIs) to permanent incisors in school going children.

Materials and method: The present study was conducted in the department of community dentistry of the dental institution. The study included 400 school going children ranging from 9-12 years old. The examination of the subjects was done by a single examiner to avoid any clinical bias. The examination was conducted in separate rooms under natural light using a moth mirror and explorer at a community centre. Only maxillary and mandibular permanent incisors were examined by the examiners. For the assessment of type of traumatic injury, Elli's and Davey's classification was used.

Results: A total of 400 patients were included in the study. 212 subjects were boys and 188 subjects were girls. The age of subjects ranged from 9 to 12 years. Out of 400 students examined, tooth fracture was diagnosed in 37 subjects (9.25%). Class I fracture was seen in 19 subjects, Class II fracture was seen in 11 subjects, Class III fracture was seen in 3 subjects, Class IV and Class V fractures were seen in 2 subjects each.

Conclusion: From the results, it should be concluded that preventive measures for traumatic tooth injuries should be provided to teachers and parents to prevent the prevalence of fractured incisors.

Keywords: Incisors, permanent teeth, Tooth Fracture

Introduction

Injuries during childhood have been considered a global public health problem and injuries have become the primary cause of death and disability of human beings ^[1]. It has been estimated that in 2000, 12% of the burden of disease and 9% of deaths worldwide were due to injuries ^[2]. The prevalence of traumatic dental injuries (TDIs) to anterior teeth among schoolchildren has been studied in different parts of the world by many researchers, and a wide range of variation has been found. In Asia and Africa, the prevalence of TDI to anterior teeth among adolescents ranges from 4% to 35% and 15% to 21%, respectively. In America and Europe, the prevalence varied from 15% to 23% and 23% to 35%, respectively ^[3]. These figures represent the burden of TDI on the community, affecting the populace of various age groups. Hence, traumatic dental injuries to anterior teeth have become a significant public health problem, by having a considerable effect on a child's day to day life, in addition to its high prevalence. Hence, the present study was planned to assess the prevalence of Traumatic dental injuries (TDIs) to permanent incisors in school going children.

Materials and method

The present study was conducted in the department of community dentistry of the dental institution. For the ethical approval, the study protocol was submitted to the ethical committee of the dental institute and approval was obtained. The study included 400 school going children ranging from 9-12 years old. The examination of the subjects was done by a single examiner to avoid any clinical bias. A pre-approved proforma was used in the study.

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A written informed consent was obtained from the parents of the subjects. The examination was conducted in separate rooms under natural light using a moth mirror and explorer at a community centre.

Only maxillary and mandibular permanent incisors were examined by the examiners. For the assessment of type of traumatic injury, Elli's and Davey's classification was used. The results were recorded and tabulated for further evaluation.

The statistical analysis of the data was done using SPSS program version 20.0 for windows. Student's t-test and Chi-square test were used for statistics analysis of the data. A p-value less than 0.05 was prefixed as statistically significant.

Results

A total of 400 patients were included in the study. 212 subjects were boys and 188 subjects were girls. The age of subjects ranged from 9 to 12 years. Out of 400 students examined, tooth fracture was diagnosed in 37 subjects (9.25%). **Table 1** shows the frequency of subjects with various types of tooth fractures in the study population according to Elli's and Davey's Classification. We observed that Class I fracture was seen in 19 subjects, Class II fracture was seen in 11 subjects, Class III fracture was seen in 3 subjects, Class IV and Class V fractures were seen in 2 subjects each. Class I fracture was seen in more than half of the subjects. The results were statistically significant ($P < 0.05$) [Fig 1].

Diags and tables

Table 1: Frequency of subjects with various types of tooth fractures according to Elli's and Davey's Classification

Type of Fracture	Number of Fractured Teeth	Percentage (%)
Class I	19	51.35
Class II	11	29.72
Class III	3	8.1
Class IV	2	5.4
Class V	2	5.4
Total	37	100%

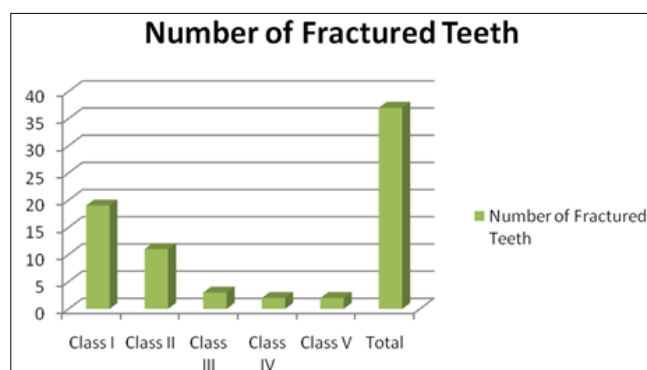


Fig 1: Frequency of subjects with various types of tooth fractures according to Elli's and Davey's Classification

Discussion

The Ellis classification of fractures of anterior teeth has been used in many previous studies for recording dental trauma. Use of a simple classification, e.g., Ellis and Davey classification of fractures (1970) [5], was preferred over other classifications, as injuries to the alveolar socket and fractures of jaws or gingival lacerations were not evaluated

in the present study. Using this classification was easy and allowed the rapid recording of reliable data [6]. The present study was planned to assess the traumatic tooth injury to permanent incisors in school going children. We observed that only 9.25 subjects were found to be having fractured incisors. Out of these subjects, more than 50% of subjects had Elli's Class I fracture. The results were compared with some other studies from the literature and results were found to be consistent. Marcenes W *et al.* assessed the causes and the prevalence of traumatic injuries to the permanent incisors of 12-year-old schoolchildren in Jaragua do Sul, Brazil. Public and private primary schools participated in the study. 476 children of both sexes, selected by multistage sampling technique were included in the study. Clinical examination of upper and lower permanent incisors was done. Boys experienced double the percentage of injuries compared to girls. Children with incisal overjet greater than 5 mm and inadequate lip coverage were not more likely to have experienced dental injuries. The main causes of injuries to the permanent incisors were falls (26 per cent), traffic accidents (20.5 per cent), sports (19.2 per cent), violence (16.4 per cent) and collisions with people or inanimate objects (6.8 per cent). Socio-economic measures had no significant effect on prevalence of trauma. The authors concluded that policy makers must take the causes of trauma into account when developing a strategy for the prevention of dental injuries. The role of violence in causing traumatic dental injuries has been underestimated. Hamdan MA *et al.* assessed the prevalence and related factors of incisor trauma among 12-year-old Jordanian schoolchildren. A sample of 1,878 schoolchildren aged 12 years, 940 boys and 938 girls, were randomly selected from 128 schools in urban and rural areas. Ellis classification was used to record the dental injuries on incisors. Of the children examined 13.8% showed dental trauma. Difference in prevalence between boys (17.1%) and girls (10.6%) was statistically significant. Maxillary central incisors were the most affected (79.2%) and the most common type of crown injury was enamel-dentin fracture (40.6%). The relationship between dental injuries and socio-economic indicators was not statistically significant. There was a tendency for children with an incisal overjet greater than 5.0 mm to have experienced dental injuries. Treatment need due to dental injuries was very high but less than untreated damage. It was concluded by the authors that the prevalence of traumatic injuries to permanent incisors in 12-year-old Jordanian schoolchildren was close to that found in other countries. Being a boy and having overjet greater than 5.0 mm were significant predisposing factors to dental injuries [7, 8].

Marcenes W *et al.* assessed epidemiological data concerning dental injuries to the permanent incisors of Syrian children. It included 1087 children aged 9 to 12 years, of both sexes, randomly selected from public and private primary schools in Damascus. The response rate was 100%. 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. The difference in prevalence between boys and girls was not statistically significant. The majority (59.8%) of children who had experienced injuries to the permanent incisors reported that they were not taken to the dentist for evaluation or treatment of the damage. Among those children who had experienced traumatic injuries to the teeth 93.1% presented with untreated damage. Because some

injuries were minor, such as small enamel fractures, the proportion of children who needed treatment was 63.2%. There was a tendency for children with an incisal overjet greater than 5 mm to have experienced dental injuries. Children with inadequate lip coverage were more likely to have experienced dental injuries than those with adequate lip coverage. The most common reported cause of injuries to the permanent incisors was violence (42.5%), followed by traffic accidents (24.1%), collisions with people or inanimate objects (16.0%) and falls (9.1%). In conclusion, traumatic dental injury may pose a serious dental public health problem. Nicolau B *et al.* carried out a cross-sectional survey. This involved 652 out of a total of 764 (85%) 13-year-old adolescents enrolled in private and public schools located in urban areas in Cianorte, Brazil. They were interviewed and examined for traumatic dental injuries by one trained examiner using validated criteria. The prevalence of traumatic injuries to the permanent incisors was 20.4%. The most common reported cause of injuries to the permanent incisors was falls (24.1%) followed by collisions with people or inanimate objects (15%), traffic accidents (10.5%), misuse of the teeth (6%), sports (2.3%) and violence (1.5%). Unknown causes accounted for 40.6%. The relationship between dental injuries and socioeconomic indicators was not statistically significant. In conclusion, being from a non-nuclear family, overweight and a boy increased the risk of having traumatic dental injury, but the relationship with socio-economic indicators was not statistically significant^[9, 10].

Conclusion

From the results, it should be concluded that preventive measures for traumatic tooth injuries should be provided to teachers and parents to prevent the prevalence of fractured incisors.

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