

# PREVALENCE AND ETIOLOGY OF TRAUMATIC DENTAL INJURIES IN 8-14 YEAR OLD CHILDREN IN HYDERABAD CITY - AN EPIDEMIOLOGICAL STUDY

## ABSTRACT

**Objectives:** To assess the prevalence, type and cause of traumatic injuries to anterior teeth among 8 to 14 year old school going children in Hyderabad city.

**Study Design:** A total of 2350 children from various schools across Hyderabad including 1245 girls and 1105 boys in the age group of 8 to 14 years were included in the study. The presence of traumatic dental injuries was assessed by clinical examination and the type of injury if present was classified according to Ellis classification. Data regarding the place and cause of injury was also noted through a questionnaire.

**Results:** A prevalence rate of 2.6% for traumatic dental injuries was noted in the present study. Males were more affected than females in the ratio 2.8:1. Ellis class II fractures were the most common type of fractures closely followed by Ellis class III. Maxillary central incisors were the most commonly affected teeth. Accidental falls at home accounted for most of the causes of trauma followed by falls at school and Road Traffic Accidents.

**Conclusion:** Community and School Dental Education programs must be conducted on a large scale basis to increase awareness among the population regarding these injuries and their management.

**Keywords:** Prevalence, Trauma, Dental injuries, Anterior teeth fractures, Ellis Fractures.

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## INTRODUCTION

Traumatic dental injuries (TDI) affect the teeth and other hard and soft tissues in and around the oral cavity. These injuries are usually sudden, circumstantial, unanticipated, accidental, and quite often require emergency attention. They may not be pathology but the outcome of a set of unavoidable lifetime risk factors.<sup>1</sup>

Dental injuries can become an important public health problem not only because they are comparatively high in prevalence, but also because they have a significant effect on the quality of life of children. Most dental injuries involve anterior teeth, which may result in restraints on biting, speech difficulties, and an embarrassment to show one's teeth posing psychological effect to the child.<sup>2</sup>

Traumatic injuries are the third major cause of teeth mortality. Kids actively indulge in outdoor play during school age. While these actions are indicators of the child's growth and development, loss of control and impaired movements enhance the risk of injury.<sup>3</sup>

Therefore, traumatic anterior teeth injuries present a tremendous challenge to the dental profession, both in terms of treating and preventing the sequelae of injuries. The objective of prevention requires reaching out at the community level to those particularly susceptible to trauma. Thus, information on the incidence of traumatic injuries to the teeth and related variables such as gender, frequently affected tooth/teeth and causes of trauma need to be documented. So that they help in planning and implementing efficient trauma prevention and educational strategies.<sup>4</sup>

Due to limited literature regarding epidemiological data of traumatic injuries in Telanagana state, India, the present study is conducted to determine the prevalence and etiology of traumatic dental injuries among 8-14 year old school going children in Hyderabad city in Telanagana state, South India.

## METHODOLOGY

A cross-sectional study was carried out involving 8 to 14 year old children who were

brought to the department for routine dental check-up by the volunteers of the Rashtriya Bala Swastha Kendra (RBSK) group. These children came from various government schools across Hyderabad.

The present study included only the children with completely erupted permanent anterior teeth. The children with special health care needs and also children with severe dental fluorosis, incompletely erupted anterior teeth and children who are undergoing orthodontic treatment were excluded from the study. A total of 2350 children including 1245 boys and 1105 girls in this age group were included in the study.

Dental examination was done as per WHO type IV criteria. The traumatic injuries were classified according to Ellis and Daveys classification.<sup>5</sup> However, type VI injury was not recorded, as dental radiographs were not taken during the examination. The examination was carried out by a single trained dental surgeon. A close ended questionnaire was prepared to collect data. Sociodemographic data included age and sex. Non clinical data collected included place of injury, cause of injury and treatment undertaken due to injury.

The sample size (nh) was determined using the formula

$$nh = z^2 (p) (q) (f) / (e)^2$$

z- the statistic that defines the level of confidence desired (1.96)

f- the sample design effect, deff, assumed to be 2.0 (default value)

p- the proportion of the total population accounted for by the target population (0.14)

e- the margin of error to be attained (0.02)

Thus the sample size was rounded up to 2350 to be adequate for determining the prevalence rate in the children of Hyderabad city.

## Statistical analysis:

The data was analysed with Statistical Package for Social Sciences (SPSS) for Windows 25.0 (SPSS, Inc. Chicago, Illinois). Descriptive statistics were used to analyse the data.

## RESULTS

A total of 2350 children including 1245 boys (53%) and 1105 (47%) girls were examined and interviewed for Traumatic Dental Injuries. Sixty one children were found to be affected by Traumatic Dental Injuries showing a prevalence rate of 2.59%. Males accounted for 45(73.7%) affected children in the study, whereas females accounted for 16(26.3%). Overall males were found to be more affected than females with the ratio of 2.8:1 (45 boys:16 girls) (Table 1). While assessing the nature of trauma Ellis class II fractures accounted for 27 of the 61 cases noted (44.2%), followed by Ellis class III (32.8%) and class I (6.6%) fractures. Fractured teeth became non-vital in 3 cases (4.9%) and while 3 teeth (4.9%) showed Ellis class VIII fracture (Table 2).

When the cause of trauma was determined, accidental falls at home (47.5%) and at school (27.9%) accounted for majority of the cases followed by collisions or accidental blows (9.8%), road traffic accidents (6.6%) and incidences of violence (4.9%) (Table 3).

The teeth most commonly affected were the Maxillary Central Incisors (either one or both) 90.2%, followed by Maxillary Lateral Incisors along with one or both Maxillary Central Incisors 9.8%. Isolated maxillary lateral incisor fractures or mandibular anterior teeth fractures were not seen in the study sample (Table 4).

## DISCUSSION

Trauma to the child dentition is a significant problem, since fracture of one or more teeth, especially anteriors, may result in pain, loss of function, poor esthetics and psychological trauma to both parent and the child.

The International Association of Dental Traumatology<sup>6</sup> reports that one out of every two children sustains a dental injury, most often between the ages of 8 and 12. That is reason in the present study this age group was chosen and also permanent incisors will be completely erupted in this age group.

**Table 1: Distribution of Traumatic Dental Injuries based on gender**

Gender	Frequency	Percent
Male	45	73.7
Female	16	26.3
Total	61	100.0

**Table 2: Frequency of Ellis Fractures**

Ellis fractures	Frequency	Percent
Class I	4	6.6
Class II	27	44.2
Class III	20	32.8
Class IV	3	4.9
Multiple fractures	4	6.6
Class VIII	3	4.9
Total	61	100.0

**Table 3: Causes of fracture**

Cause of fracture	Frequency	Percent
Accidental Falls in school	16	27.9
Accident falls at home	28	47.5
RTA	4	6.6
Accidental blow	6	9.8
Violence	3	4.9
Others	4	6.6
Total	61	100.0

**Table 4: Teeth involved in fractures**

Teeth involved	Frequency	Percent
Maxillary Central incisors	55	90.2
Maxillary central and lateral incisors	6	9.8
Total	61	100.0

Depending on the classification system used for traumatic injuries, the dentition involved, geographical and behavioural differences between study locations and countries, the prevalence of traumatic dental injuries worldwide ranges from 6% to 34%.<sup>1</sup> In the present study, the prevalence of Traumatic Dental Injuries was found to be 2.6%. A lower prevalence rate noted in this study may be attributed to the sample selected, type of study or classification used.

Males were found to be more affected than females in the ratio 2.8:1. This finding may be related to their tendency to be more active and involved in vigorous outdoor activities and games than girls. Many previous studies<sup>1,2,3,7,8</sup> are in accordance with this finding while some studies show no gender differences<sup>9</sup>.

Ellis classification<sup>5</sup> is a simple classification for dental trauma recording. Since we did not assess alveolar socket injuries and jaw fractures or gingival or oral mucosa laceration, we preferred to use this basic and standard classification rather than Andreasen's classification. Ellis class II fracture (uncomplicated crown fracture involving enamel and dentin) was the most prevalent type of injury observed followed by Ellis class III (complicated crown fracture involving enamel dentin and pulp). This was in line with the research performed by Ahmad A8, Singh N et al<sup>9</sup>, Osadolor OO<sup>10</sup>, Bastone EB.<sup>11</sup> Class I fractures accounted for 6.6 percent among all fractures. Fractured teeth became non-vital in 3 cases (4.9 percent) and while 3 teeth (4.9 percent) showed Ellis class VIII fracture. It was surprising that none of these children underwent any dental treatment for these injuries except perhaps taking medication at the time of injury.

Falls are the most prevalent causes of etiology. Our research disclosed that traumatic injury etiology was predominantly due to falls (78%). Studies conducted by Gojanur S et al<sup>3</sup>, Singh et al<sup>9</sup> also found that this finding is consistent with most literature research. In our present study, we have divided falls into two categories- falls at home and falls at school. Falls at home are more common than at school. The patients home for both primary and permanent dentition has been continuously recorded as the most common place for dental

trauma.<sup>1,12,13,14,15</sup> One or both Maxillary Centrals were the most commonly affected teeth (over 90%), followed by combination of maxillary central and lateral incisors (9.8%). The findings of this study including males being more affected and maxillary central incisors being the most commonly affected teeth are in accordance with the findings of Govindrajana et al<sup>15</sup>, Rouhani et al.<sup>16</sup>

Also contributing factors are the economic situation of the patient and absence of accessibility to adequate dental care. Lack of awareness has been a contributing factor for not seeking dental care immediately after injury in this study group.

## CONCLUSION

The prevalence of dental trauma is 2.75%, males account for more TDI than females, and falls at home are regarded to be the most prevalent etiological fracture. Dental injury has an effect on the day-to-day lives of the child and a credible evidence base need to be established where standardized classification and adjunct data collection techniques can help. Community and school education programs need to be put in place to increase awareness and prevent dental trauma.

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