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ORIGINAL RESEARCH ARTICLE

PREVALENCE OF TRAUMATIC DENTAL INJURIES AMONG 1–14-YEAR-OLD CHILDREN IN TERTIARY CARE CENTER OF NEPAL

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ABSTRACT

Background: Traumatic dental injuries have now become a leading health issue due to their high prevalence and major impact on children's well-being. These dental injuries may result in esthetic, psychosocial, functional, therapeutic problems and lead to irreversible damage to dentition and supporting structure. This study was aimed to evaluate the prevalence of traumatic dental injuries in children from 1 to 14 years of age.

Methods: This cross-sectional study was conducted among 1–14-year-old children who visited Department of Pedodontics, Nepal Medical College during the study period. The oral examination was done with the help of a dental mirror and explorer and were evaluated for age, gender, type of trauma (based on history/clinical examination) and involvement of hard and soft issue. The traumatic dental injury (hard tissue injury) was assessed using Ellis and Davey's classification.

Results: Out of the 2,391 patients examined during the six months duration, 31 (1.29%) patients presented with traumatic dental injuries, among which male, 18 (58.1%) presented with more traumatic dental injuries than females 13 (41.9%). The involvement of hard tissue injury (64.5%) was more than soft tissue injury (12.9%). Both the permanent and deciduous maxillary central and lateral incisors were most frequently involved than other teeth. (Permanent maxillary incisors 38.7 %; Deciduous maxillary incisors 41.9%).

Conclusions: In this study the teeth that was more frequently involved was maxillary anterior teeth. The most common reason for trauma was fall injury.

INTRODUCTION

Traumatic dental injury (TDI) is an injury inflicted to the teeth, periodontium and surrounding soft tissues.[1] It has now become a leading health issue due to their high prevalence and serious impact on physical as well as a psychological well-being. Dental trauma is common among children and adolescents posing health and social problems.[2] Trauma to the permanent anterior teeth is a common finding. It is an irreversible pathology that after the occurrence is characterized by a life-long effect.[3]

Although the oral region comprises as small an area as 1% of the total body area, oral injuries account for 5% of all bodily injuries in all ages, and in pre-school children the proportion is as high as 17%.[4] A meta-analysis of the worldwide global burden of TDI reported a prevalence of 22.7% in primary dentition 15.2% in permanent dentition.[5] Age and gender are regarded as risk factors for dental traumatic injuries. Gender wise distribution of trauma in various studies have made an implication on male predominance.[5]

A study done by Dikshit et al in the Nepali population revealed male gender predilection and the most affected teeth to be primary and permanent maxillary central incisors.[6] Dental trauma entail significant emotional and social costs to children and their families and constitute the most serious dental condition experienced by children.[7] According to a study done by Chaudhary et al the most common treatment for traumatized tooth was root canal treatment (25%), followed by composite resin restorations (24%), splinting (10%), direct pulp capping (4.9%), repositioning and splinting (3.27%).[8] Management of TDI is complex and necessitates a complete correct diagnosis and treatment plan according to the age. Hence, the present study was carried out to evaluate the prevalence of traumatic dental injuries in children from 1 to 14 years of age.

METHODS

A descriptive cross-sectional study was conducted at the Department of Pedodontics, Nepal Medical College. The study was conducted among children aged 1-14 years who visited to the department during the study period. Data for the study was collected from 2nd August 2023 till 2nd February 2024.The inclusion criteria for the study sample were all the children

reporting with dental injuries. The written consent and assent were taken from both parents and children. The study was conducted after obtaining the ethical clearance from the Research and Institutional Review Committee (IRC) of Nepal Medical College (Ref. no.: 10-080/81).

The oral examination was done with the help of a dental mirror and explorer under well illumination and were evaluated for age, gender, type of trauma (based on history/clinical examination) and involvement of hard and soft issue. The traumatic dental injury (hard tissue injury) was assessed using Ellis and Davey's classification. [9]

Data was entered, coded and edited to Statistical Package for the Social Sciences (SPSS) version 16 for analysis. Descriptive statistics was calculated for frequency, percentage, mean and standard deviation.

RESULTS

Out of the 2,391 patients examined in the six months duration; 31 (1.29%) patients presented with TDIs. Among which males, 18 (58.1%) presented with more TDI than females 13 (41.9%) (Table 1).

Table 1: Distribution of children according to gender

Gender	n (%)
Male	18 (58.1)
Female	13 (41.9)
Total	31 (100)

Maximum number of traumatic dental injuries occurred between 1 and 8 years of age (Table 2).

Table 2: Distribution of children according to age

Age (in years)	n (%)
1	4 (12.9)
2	1 (3.2)
3	2 (6.5)
4	2 (6.5)
5	3 (9.7)
6	1 (3.2)
7	3 (9.7)
8	4 (12.9)
9	2 (6.5)
10	3 (9.7)
11	2 (6.5)
12	2 (6.5)
13	2 (6.5)
Total	31 (100)
Age (Mean ±SD)	6.90±3.76

The most common trauma was Ellis and Davey's class IX (41.9%) (Table 3). Hard tissue injury (64.5%) was more than soft tissue injury (12.9%) (Table 4).

Table 3: Distribution of affected teeth according to type of trauma (Hard tissue)

Type of trauma	n (%)
Ellis class I	-
Ellis class II	2 (5)
Ellis class III	5 (12.5)
Ellis class IV	3 (7.5)
Ellis class V	3 (7.5)
Ellis class VI	-
Ellis class VII	6 (15)
Ellis class VIII	-
Ellis class IX	21 (52.5)
Total	40 (100)

Table 4: Distribution of children according to involvement of hard tissue and soft tissue

Tissue involvement	n (%)
Cases with only soft tissue injury	4 (12.9)
Cases with only hard tissue injury	20 (64.5)
Both	7 (22.6)
Total	31(100)

The total number of teeth involved was 40. Both Permanent and Deciduous maxillary central and lateral incisors were most frequently involved than other teeth. (Permanent maxillary incisors 40%; Deciduous maxillary incisors 52.5%) (Table 5).

Table 5: Distribution of teeth with traumatic injuries

Teeth involved	n (%)
Permanent maxillary incisors	16 (40)
Permanent mandibular incisors	3 (7.5)
Deciduous maxillary incisors	21 (52.5)
Total	40

The most frequent etiologies for TDIs were fall injury (58.1%), followed by external trauma (by gate handle, bundle of keys, injury of lower teeth when upper teeth were being extracted at home) (19.4%) followed by road traffic accidents (12.9%) and sports injury. (9.7%) (Table 6)

Table 6: Etiology of trauma

Etiology	n (%)
Fall injury	18 (58.1)
Road traffic accident	4 (12.9)
External trauma (due to various objects)	6 (19.4)
Sports related	3 (9.7)
Total	31 (100)

DISCUSSION

Awareness about the epidemiological profile of TDI is one of the initial steps in establishing coping policies. It helps for establishing preventive strategies and formulation of

management protocols. In the present study, the prevalence of TDI in 1–14-year-old children was 1.29%. This is comparable with the observation of a study done in New Delhi which had reported a prevalence of 1.25% in the same age group.[10] The prevalence was lower as compared to other study conducted in different Nepalese population, which had a prevalence of 7.86%.[1] This could be due to the fact that this study was carried out in hospital setup and insignificant past dental trauma got neglected. The discrepancy in the prevalence rate could also be attributed to the different epidemiological methodology used by the authors to collect data.[11] Possibly not all traumatic injuries are reported; local, environmental, behavioral and cultural diversities of countries could have an influence on the results as well.[12]

More prevalence of trauma in the ages 1 and 8 years (12.9%), was noted in this study. This can be explained by the imbalance of the newly walking children leading to falling accidents. Thus, small children should be cared more prudently which will eliminate the risk of any injury.[2] In accordance with this study, a study done in Turkish population also observed that injury rates were highest among children age 6 and ages 8-10.[13] As children in this age group are actively involved in multiple outdoor activities.[10]

The present study showed boys were more involved in traumatic injuries than girls, which was in agreement with the results of studies done in Brazilian population.[14–16] Some of the studies have shown a reduction in the gender ratio which might be due to increased sports activities among girls. According to the various outcome of the studies for a long period gender had been determined as one of the predisposing factors of dental injuries, while now traumatic dental injuries are more likely to be related to the activities and the environment.[17]

Ellis and Davey's classification is a simple classification which uniformly records dental traumatic injury. Ellis class IX (41.9%) was recorded as the most frequent type of injury to the dentition. In the literature, Ellis class I fracture is the most common type of injury that is reported.[18,19] This could be explained due to difference in the location of studies conducted, which were in schools whereas in the present study most of the patients reported to the dental hospital set up with a chief complaint of pain, swelling and discomfort due to trauma. Also, in Ellis class I the tooth may be asymptomatic and esthetically uncompromised which could be one the reason for its less reporting in this study.

Hard tissue injury (dental injury) were most common injuries followed by oral soft tissue injuries. This finding corroborated with the study which was done in Sweden.[4] Soft tissue injuries were observed in 12.9% of the cases in this study whereas a similar study done in Nepalese population showed soft tissue injury to be of 43.8%.[20] In the maximum number of patients the soft tissue injuries were seen together with dental injuries; very few secluded soft tissue injuries were seen. This probably implies the fact that patients go for treatment for tooth injuries but seldom for only a soft tissue contusion, unless the tissue is lacerated.

Permanent and deciduous maxillary incisors were the most common teeth to sustain tooth fracture. These results were similar to a study done in Dhulikhel, Nepal.[20] Some other studies done in various geographical location has also seen this similar finding.[21–23]This is probably due to their vulnerable anatomical position and angulation in the jaw.

Fall injury was the most common causes of injury in this study. These finding resonated with studies done in different locations in Nepal. [1,20]In contradiction to this data the main reasons for TDI were found to be recreational activities followed by sports, misuse of teeth [such as onychophagy, removing bottle caps with teeth, biting pencil or pen], and falls in a study done on Mexico.[24]Another study done in an Indian population revealed the commonest etiology of TDI to be road traffic accidents.[25]

Even minor traumas may cause serious repercussions with damage to the permanent successor, thus, pointing out the need to seek treatment for a traumatized primary tooth as well as its successor. The severity of trauma must be determined by a dentist and preferably the same dentist should follow up the traumatized tooth. Regarding the findings of this study, it should be interpreted, considering it was conducted in a single institution which limits the generalizability of the results and the study involved only those patients' seeking treatment for TDIs, which could have resulted in overlooking minor concomitant injury.

CONCLUSION

Traumatic dental injuries are recognized public dental health problem worldwide. In this study the teeth that was more frequently involved was maxillary anterior teeth. The most common reason for trauma was fall injury. TDI requires immediate attention and proper management to avoid complications in future. Effective, efficient and quality treatment plays a crucial role in the prognosis of the affected teeth.

CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

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