

Prevalence of Traumatic Dental Injuries among 1- to 14-year-old Children: A Retrospective Study

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ABSTRACT

Aim and objective: To evaluate the prevalence of dental trauma in children in the age-group of 1 to 14 years in New Delhi.

Materials and methods: This is a retrospective study conducted from March 2017 to December 2017. A total of 6,765 children between 1 year and 14 years of age, who reported in OPD were evaluated for age, gender, type of trauma, and involvement of soft tissue.

Results: The mean age of participating children was 9.98 ± 1.704 and trauma was present in 1.25% of children. Ellis class IV type of trauma was seen in maximum (36.5%) cases with maxillary central incisors being most frequently injured during dental trauma.

Conclusion: The present retrospective study surveys traumatic dental injuries which are frequently seen. The knowledge of the prevalence and etiology of trauma to anterior teeth is necessary to identify the risk groups, treatment requirements, and strengthening of preventive programs.

Keywords: Ellis class IV, Retrospective, Trauma.

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INTRODUCTION

A sudden force experienced by a human body, in an amount that is above the threshold of physical tolerance, leads to a traumatic physical injury.¹ The dental trauma has a considerable impact on the child's psychology and esthetics which lays a perpetual effect on their behavior.²

An oral injury estimates for about 5% of all physical injuries with 17% prevalence in children of preschool age.³ Incidence of trauma to primary and permanent teeth in children is 1–3% with a steady prevalence of 20–30%.⁴

There is multiple and variable etiology of dental trauma comprising falls (31.7–64.2%), sports injuries (approx 40.2%), bicycle accidents (approx 19.5%), road traffic accidents (approx 7.8%), and physical violent injury (approx 6.6%).⁵ According to several studies, increasing overjet, incompetent lips, or class II occlusal relationships are attributed to common risk factors for traumatic injury to anterior teeth.^{6–8} Moreover, boys are affected more than girls with an average ratio of 2:1, showing a significant gender difference with respect to dental injury experience.^{9–11} Trauma to primary dentition may result in enamel hypoplasia, discoloration, delayed eruption, and injury to the developing permanent teeth.¹² Traumatic dental injuries must be considered an important issue as apart from pain and potential infection, it also leads altered facial esthetics, hampers speech, and has adverse emotional impacts, negatively impacting the child's quality of life.¹³

It is necessary to study the prevalence and etiopathogenesis of dental trauma as it is of major public health concern owing to its high frequency and adverse effect on the quality of life.¹⁴ Trauma to dentition is not considered a disease and no one is at nil risk of experiencing such deranging injuries. Trauma research involves time and extensive labor with a population-specific scope. The research on the occurrence of traumatic injuries to the dentition is limited and none correlates with all its potential causative factors. There is less literature in India regarding the prevalence of trauma

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to dentition in the pediatric population. Hence, the current study was planned to evaluate the prevalence of trauma to the dentition in children in the age-group of 1 to 14 years in New Delhi.

MATERIALS AND METHODS

The present retrospective pilot study was performed in the Department of Pedodontics and Preventive Dentistry for 10 months. The total study sample comprised of 6,765 children between 1 year and 14 years of age, who reported to the department between March 2017 and December 2017. Out of these, there were 85 children in whom trauma to teeth and surrounding structures was recorded. Data including age, gender, type of trauma, and involvement of soft tissue were extracted from departmental records maintained for every outpatient irrespective of presence or absence of trauma. Injuries to dentition were classified based on Ellis and Davey's classification (1960).

The study outcomes were calculated using percentages, averages, standard deviation, and appropriate tests of proportion. The prevalence of traumatic injury in a specific age-group with gender predilection and type of dental tissue injury with tooth involved was analyzed.

RESULTS

The study was conducted to evaluate the prevalence of dental trauma in children of the age-group of 1 to 14 years in New Delhi. It was a retrospective study consisting of 6,765 children who reported in the department and out of which 85 (1.25%) children reported with a chief complaint of dental trauma. Data including age, gender, type of trauma with tooth involvement, and associated soft tissue injuries were evaluated.

The mean age of children was 9.98 ± 1.704 . The minimum age reported was 5 years and the maximum was 14 years. The age-wise distribution of children is shown in Table 1 and Figure 1. The mean age of males was 10.16 years and that of females was 9.28 years. There were 78.8% of males and 21.2% of females who suffered trauma to oral and maxillofacial region as shown in Table 2 and Figure 2.

Ellis class IV type of trauma was seen in maximum (36.5%) cases, Ellis class VII fracture in 17.6%, and Ellis class III in 16.5% cases. Table 3 and Figure 3 show the distribution of children based on the type of trauma.

Maxillary left central incisor (21) was involved in maximum cases of trauma (38.8%) while maxillary right central incisor was seen in 11 cases. The involvement of maxillary canine and lower incisors was found to be only 1.2% as shown in Table 4 and Figure 4.

Out of the total, soft tissue involvement was seen in 50.6% of cases with maximum involvement in males as compared to females (Table 5).

Table 1: Distribution of children according to age

Age (years)	No. of children (N)
5	01
7	4
8	16
9	11
10	17
11	16
12	19
14	01

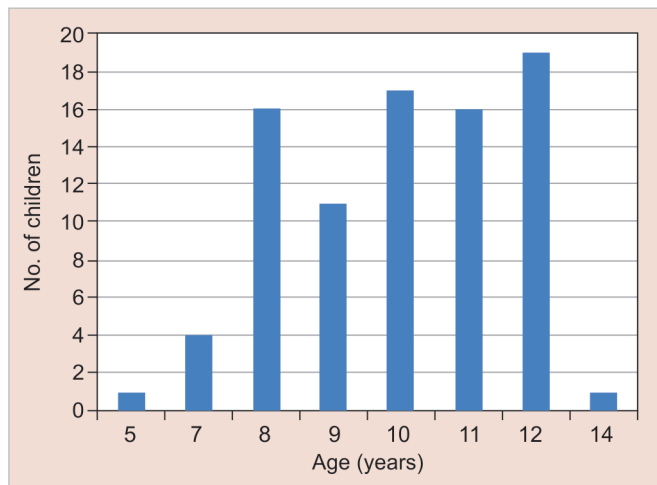


Fig. 1: Distribution of children according to age

DISCUSSION

The present study aimed to gain an insight into the occurrence of trauma to primary and permanent teeth in children from 1 to 14 years of age in a Dental Hospital in New Delhi. The overall prevalence of dental traumatic injury was 1.25%, which was lower as compared to other studies available in the literature. This could be due to the fact that most of the previous studies, were conducted in schools whereas this study was conducted in Hospital setup and insignificant past dental trauma got neglected.

In the present study, children up to the age of 14 years were included, as this age period is marked by extensive physical growth and development. The children in this age-group are actively involved in multiple outdoor activities. This study shows that the prevalence of trauma was higher in the age-group 10 to 12 years which was in similarity to Govindarajan et al.'s research which reported a higher number of traumatic injuries in 10 to 13-year age-group.¹⁵

The present study shows the significance of gender as a predisposing factor in dental trauma. Increased frequency was seen among boys than girls which was 78.8% which is in accordance with many other studies. A similar result was found in different geographical locations in their study.^{8,9,16,17}

Ellis and Davey's classification is a simple classification to uniformly record the dental traumatic injury. As the dental injuries were not correlated with skeletal injuries, this classification was preferred over Andreasen's classification. Ellis type IV fracture (36.5%) was recorded as the most frequent type of injury to the dentition. In most of the studies, Ellis Class I fracture is the most common type of injury.^{18,19} This could be explained due to variance in the location of studies conducted that 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 due to complicated crown fracture.

Table 2: Distribution of children according to gender

Gender	No. of children (N)
Males	67
Females	18

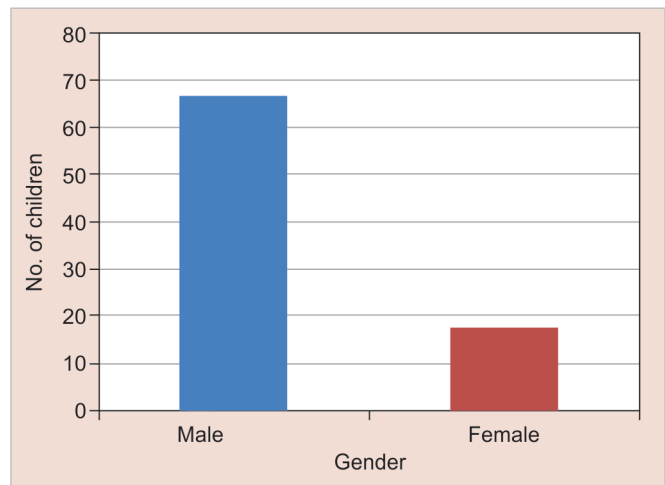


Fig. 2: Distribution of children according to gender

Table 3: Distribution of children according to type of trauma

Type of trauma	No. of children (N)	Percentage
Ellis Class I	2	2.4
Ellis Class II	8	9.4
Ellis Class III	14	16.5
Ellis Class IV	31	36.5
Ellis Class V	7	8.2
Ellis Class VI	4	4.7
Ellis Class VII	15	17.6
Ellis Class VIII	1	1.2
Ellis Class IX	3	3.5

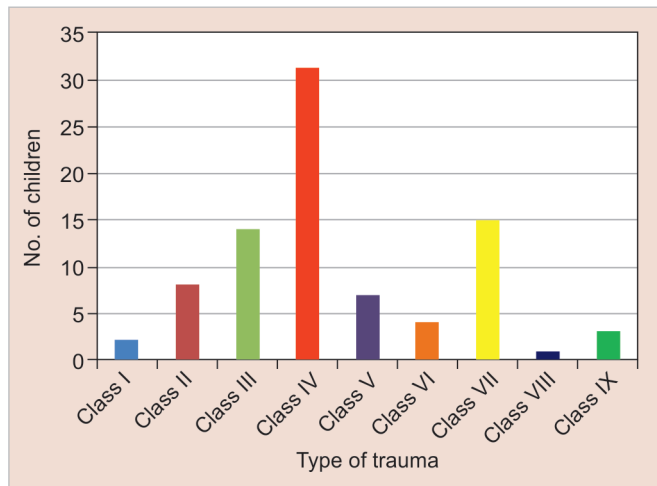


Fig. 3: Distribution of children according to type of trauma

In this study, trauma to maxillary teeth is more prevalent than those of the opposing arch; the existing literature is highly supportive of this inference. Maxillary central incisors are more commonly affected owing to their position and angulation in the jaw.^{20–23} Moreover in most of the cases, the asymptomatic trauma in posterior teeth remains neglected by parents or caregivers.

In the present study, soft tissue involvement was seen in almost half of the cases, which was due to the fact that the hospital is the tertiary center, and most of the cases of road traffic accidents, fall from height and other severe injuries are dealt on a routine basis.

The study depicts that the population at greatest risk are the children in the mixed dentition phase. Therefore, primary prevention by health promotion and amelioration of potential risks must be initiated in the early mixed dentition phase to minimize the occurrence of traumatic dental injury.

CONCLUSION

In this study, a significantly high prevalence of dental trauma is found in the anterior teeth. Therefore, there is an utmost need to strengthen and establish comprehensive, preventive, and oral healthcare in the country. It is necessary to regularize preventive therapies and instructions at early ages in all parts of the country as oral healthcare is mostly ignored in remote areas due to lacking awareness and resources. It is highly recommended to develop a trauma prevention policy for parents and children. Regular educational programs to enhance public knowledge regarding the prevention and management of these injuries are necessary.

Table 4: Distribution of children according to tooth involvement

Tooth involved	No. of children (N)	Percentage
11	31	36.5
13	1	1.2
21	33	38.8
22	6	7.1
31	6	7.1
32	2	2.4
41	2	2.4
42	1	1.2
71	1	1.2
72	1	1.2
82	1	1.2

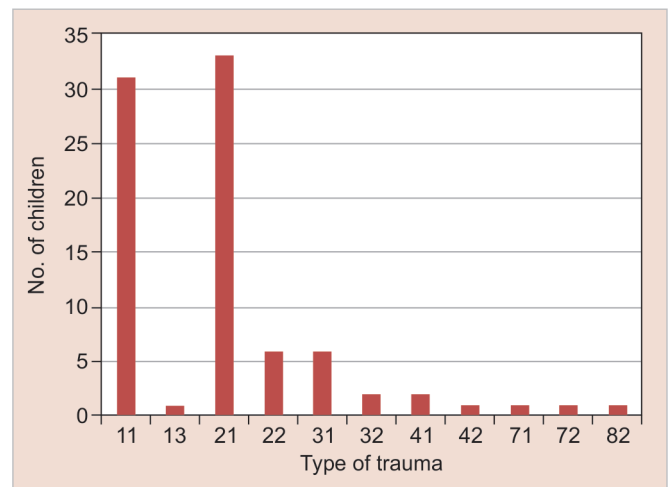


Fig. 4: Distribution of children according to tooth involvement

Table 5: Distribution of children according to soft tissue involvement

Soft tissue involvement	No. of children (N)	Percentage
Absent	42	49.4
Present	43	50.6

In these programs, the need for proper treatment of primary or permanent teeth with trauma should be stressed to evade their biological and psychological consequences.

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