

A STUDY ON PREVALENCE AND PATTERN OF TRAUMATIC DENTAL INJURIES OF PERMANENT ANTERIOR TEETH IN 9-14 YEARS OLD CHILDREN

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Abstract

Aim: The aim of the study was to evaluate the prevalence and pattern of traumatic dental injuries of permanent anterior teeth (TDI-PAT) in 9-14 years old children who reported to dental OPD of a tertiary care centre in M.P.

Material and methods: A cross sectional study was conducted on 493 children aged 9-14 years over a period of 4 months. The children were evaluated for the demographic characteristics and the prevalence and pattern of traumatic dental injuries to permanent anterior teeth.

Results: The boy to girl ratio of the study population was 1.54:1. The maximum number of the participants (n=93) belonged to the 14 years age group. The prevalence of TDI-PAT in the study sample was 11.36%. The most affected age group was 11 years (13.79%). The most common etiology implicated in occurrence of TDI-PAT were falls accounting for 37.50% injuries followed by sports related injury in 25% cases.

Conclusion: Traumatic dental injuries to permanent anterior teeth are common in 9-14 years old children. A prevalence of 11.36% was reported in this study.

Keywords: traumatic dental injury, permanent teeth, children, etiology, anterior teeth

INTRODUCTION

Traumatic dental injuries (TDIs) are one such condition that can occur at any age, but the trauma to children's teeth occurs quite frequently [1]. The most commonly involved teeth in traumatic incidents in children are the anterior teeth [2]. Oral region comprises only 1% of the total body area but oral traumatic injuries account to 5% of all the body injuries in all age

groups and 17% of all injuries in children [3]. The magnitude of this problem is substantiated by statistical data which indicates that 6% to 34% of individuals suffer from TDI during childhood or adolescence [4].

Recently oral health has been acknowledged as an integral component of overall well-being. The oral cavity serves numerous vital functions in daily life, including facilitating food intake, speech, social interaction, and appearance. Compromised oral health significantly impairs the quality of life in patients. The traumatic injuries to anterior teeth cause restrictions in biting efficiency, impaired phonetics, and negative impact on aesthetics and psycho-social wellbeing of the child [5]. Trauma that affects the hard tissue of the teeth causes pulpal and periodontal lesions. Oral pain can impede children's growth, exacerbate nutritional deficiencies and adversely affect his social interactions.

The most common factors for anterior teeth injury cited in literature are falls, accidents, cycling, sports injuries, child hood pranks or physical violence [6].

Understanding the prevalence of traumatic dental injuries (TDIs) is crucial for establishing preventive measures and determining treatment requirements. However, there is a lack of literature regarding the epidemiological data about the prevalence of traumatic dental injury in children in central India. Therefore, this study was undertaken to evaluate the prevalence of traumatic injuries to permanent anterior teeth among children aged 9-14 years.

MATERIALS AND METHODS

This study was a cross-sectional study that was conducted on 9-14 year old children who reported to outpatient department of Dentistry of a tertiary care centre during January 2022 to April 2022. Only those children were included in the study whose parents gave consent after the objective of the study was explained to them. A total of 493 children met inclusion criterion and were included in the study. A proforma was used to collect information which was divided into 2 sections. Section 1 procured information about demographic characteristics. For children with clinical evidence of traumatic dental injury the section two gathered information about the etiology and pattern of dental injury.

Children were examined clinically for any signs of TDI in the permanent anterior teeth by two examiners according to WHO criterion for oral and dental examination using mouth mirrors and explorers seated on dental chair under illumination. The examination was performed from the maxillary right canine to the mandibular right canine in a clockwise direction and the traumatic injuries were classified according to the Ellis and Davey's classification [7]. Radiographs were taken when required.

The data were tabulated and analyzed in Microsoft Office Excel worksheet (version 2007) and Statistical Package for Social Sciences (SPSS) version 19.0 was used for the data analysis.

RESULTS

The parents of 493 children gave consent for participation in the study. Out of them 286(58%) were males and 207(42%) were females. Traumatic dental injuries to anterior teeth were found in 56 patients; 34 males and 22 females [Table 1]. The male to female ratio for TDI-PAT was 1.54:1. The prevalence of TDI-PAT was 11.36%. The maximum number of children (n=93; 18.86%) belonged to the 14 year age group followed by 87 (17.65%) children in 11 year age group. The TDI-PAT was most prevalent in the 11 year age group with 13.79% children in the age group presenting with TDI-PAT [Table 2].

The most common cause of injury were falls in 37.5% of children followed by sports related injury in 25% children [Table 3].

In majority of children (64.29%) only one permanent anterior tooth was involved in traumatic dental injury. Two teeth were affected in 8.93% children [Table 4].

The most common fracture type seen in children presenting with TDI-PAT was class I fracture (according to Ellis and Davey's classification) seen in 48.21% children followed by class II fracture seen in 23.21% children [Table 5].

Table 1. Distribution of children according gender and presence of traumatic dental injury to permanent anterior teeth (TDI-PAT).

Gender	Total number examined (N=493)		Number of children with TDI-PAT (N=56)	
	n	%	n	%
Boys	286	58	34	11.89%
Girls	207	42	22	10.62%

Table 2. Distribution of patients according to age, gender and presence of TDI-PAT.

Age (Years)	Males		Female		Total	
	Total Number	TDI-PAT Present	Total Number	TDI-PAT Present	Total number of children	TDI-PAT Present
9	41	4	29	3	70	7 (10%)
10	43	5	34	4	77	9 (11.69%)
11	52	7	35	5	87	12 (13.79%)
12	47	7	37	4	84	11 (13.09%)
13	48	6	34	4	82	10 (12.19%)
14	55	5	38	2	93	7 (7.53%)

Table 3. Distribution of patients according to the etiology of dental injury

Cause of injury	Males n	Females n	Total n (%)
Falls	13	8	21 (37.50%)
Impact/collision	2	0	2 (3.57%)
Biting hard food	2	1	3 (5.36%)
Sports	8	6	14 (25%)
Road traffic accidents	7	6	13 (23.21%)
Fights/abuse	2	1	3 (5.36%)

Table 4. Distribution of patients according to number of teeth injured in TDI.

Number of injured tooth/ teeth	Number of children (n)	Percentage (%)
1	36	64.29%
2	11	19.64%
3	5	8.93%
More than three	4	7.14%

Table 5. Distribution of children according to type of tooth injury.

Type of injury	Boys		Girls		Total	
	Number n	Percentage (%)	Number n	Percentage (%)	Number n	Percentage (%)
Class I	18	52.94%	9	40.90%	27	48.21%
Class II	7	20.58%	6	27.27%	13	23.21%
Class III	2	5.88%	1	4.54%	3	5.36%
Class IV	4	11.76%	2	9.09%	6	10.71%
Class V	1	2.94%	1	4.54%	2	3.57%
Class VI	0	00%	0	0	0	00%
Class VII	2	5.88%	1	4.54%	3	5.36%
Class VIII	0	00%	2	9.09%	2	3.57%
Total	34	100%	22	100%	56	100%

DISCUSSION

Trauma to primary and permanent dentition in children and teenagers is a public health problem which is often neglected [8]. These injuries can result in lifetime consequences if they are not promptly assessed and adequately managed [9].

The prevalence of traumatic dental injury in 9-14 year children was found to be 11.36% in this study. This was in concordance to a prevalence of 16.3% reported in study by Dighe K et al. [10], 13.8%, by Gupta et al. [11], and 21 14.4% by Kumar et al [12]. Traumatic dental injuries were more common in boys with a boy to girl ratio of 1.54:1. This was in accordance

to the study by Gojanur S et al., who reported a boy to girl ratio of 1.8:1; but less than a ratio of 3.13:1 reported by Dighe K et al., in his study on 9-14 year old children [10, 13].

Falls were the most common etiology implicated in occurrence of TDI-PAT. This was similar to other studies in literature [14, 15].

TDI PAT can range from minimal loss of tooth enamel to complex fractures affecting the pulp tissue and even loss of the crown structure/ tooth. In our study the most common fractures were class I fractures (Simple fracture of the crown involving little or no dentin) followed by class II fractures (Extensive fracture of the crown involving considerable dentin, but no pulp). This finding was similar to other studies in literature [10, 12]. In our study 48.21% children sustained class I injury followed by class II injury in 23.21% children.

Increased overjet, Class III and Class II Div II malocclusion in children has also been associated with TDIs [12]. In a study by Altun C et al., it was found that children with increased over jet were 2.19 times more likely to have dental injuries than other children. It has been suggested that for children in early mixed dentition, preventive orthodontic treatment may lessen the incidence of TDIs [16].

There is variability in literature regarding TDIs which may be attributed to the different study designs, geographical area, and cultural contrasts [17]. In recent times an increase in prevalence of TDIs may be attributed to increase in recorded violence [18].

The limitation of the study was its cross-sectional design. Large scale longitudinal studies should be carried out to evaluate the association of occurrence of TDIs with a variety of risk factors. The research outcomes will facilitate implementation of preventive strategies and may restrict the incidence of dental trauma by inducing behavioral, environmental, and societal modifications.

CONCLUSION

The occurrence rate of traumatic dental injuries (TDI) to anterior teeth among school children in this study was 11.36%. Boys experienced TDI-PAT more frequently than girls. Among boys, the prevalence of TDI-PAT was 11.89%, while among girls it was 10.62%.

Early orthodontic intervention in susceptible children could serve as effective preventive measure. Utilizing protective gear like mouth guards can also mitigate the risk and severity of dental injuries in contact sports. Ensuring safe surroundings, increased supervision, promoting and reinforcing the implementation of health safety practices in children can contribute to a decrease in incidence of traumatic dental injuries.

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