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ORIGINAL ARTICLE

Prevalence of Complicated and Uncomplicated Crown Fracture in Permanent Teeth Children Age 7-12years

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ABSTRACT

Objective The purpose of this study is to identify the prevalence of uncomplicated and complicated crown fracture in permanent teeth.

Study Design: Cross-Sectional

Place and Duration: Nishter Institute of Dentistry, Multan between 2018-2020.

Methods: There were 359 patients of both genders were presented with 525 permanent teeth. Patients were aged between 7–12 years. Patients detailed demographics age, sex, type of damage sustained, presence or absence of class II Div 1 were recorded after taking informed written consent from the authority. CPI probe was used to measure the degree of overjet as described by the 1997 WHO Basic Oral Health Survey Guidelines. Prevalence of complicated and uncomplicated crown fracture was calculated among traumatic dental injuries. Complete data was analyzed by SPSS 24.0 version.

Results: Majority of the patient was male 200 (55.7%) were males and 159 (46.3%) were females. Mean age of the patients were 8.64 ±12.37 years. Falling was the most common cause of injury found in 195 (54.3%) cases followed by sports 110 (31.6%), RTA was found in 30 (8.4%) and physical violence in 24 (6.7%). Class II div 1 was present among 149 (34.2%) cases. Frequency of crown fracture was found among 43 (11.98%) cases in which complicated crown fractures were 16 (4.5%) cases and the rest 27 (7.5%) were uncomplicated crown fractures. Among 43 cases of crown fractures majority of the cases were males 27 (62.8%).

Conclusion: We concluded in this study that the prevalence of crown fracture among TDI was 11.98% and majority among them was uncomplicated crown fractures. Preventive interventions are needed because of the high incidence of oral trauma. There needs to be a greater awareness among parents and children about the dangers of mouth trauma.

Key Words: TDI (Traumatic Dental Injuries), Crown fracture, Complicated, Uncomplicated

INTRODUCTION

As a public health issue, dental injuries are widespread and frequently occur. The frequency of dental trauma may also be influenced by factors such as age, gender, socioeconomic situation, and an increased overjet in the maxillary anterior teeth. Dental trauma is a rare occurrence in the course of a typical dental practise. [1] Dental trauma is common in permanent teeth and can occur at any age. There is a higher rate of dental trauma among those in the first and second decades of life. 26.2 to 44.1 percent of all dental injuries are caused by crown fractures with or without pulp exposure, according to the American Dental Association (ADA). It is the opposite of crown-root fractures with or without pulp exposure, which account for 0.56 percent to 1.1 percent of all dental traumatic injuries [1–3]. There are a variety of treatment options for crown fractures that are reasonably simple and well-documented depending on the extent of pulp involvement. Simple adhesive reattachment of the fragment is the preferred approach in uncomplicated crown fractures if the fragment is saved. Direct resin composite restoration is preferred if the fragment is missing or unsuitable for reattachment. Conventional root canal treatment should be avoided whenever possible if the pulp has been exposed [5].

There are a number of factors to consider when treating crown fractures with exposed pulp in permanent young teeth, including the extent of pulp exposure, how long it has been since an accident, and the stage of root development. Direct pulp capping, partial pulpotomy, pulpectomy, or extraction are all options for treating crown fractures that expose the pulp. Pulpotomy is the best endodontic treatment choice for young individuals whose exposed pulp continues to function [6,7]. Cvek method partial pulpotomy is appropriate for teeth with the following characteristics: a little pulp exposure, treated within 14 days of damage, caries-free teeth, open apex or thin dentinal walls, and vital pulp. Pulp amputation is required in cases when the pulp exposure is substantial or there has been a two-week delay between the trauma and therapy [8]. Andreason defines a simple crown fracture as either a fracture of the enamel alone or a fracture of both the enamel and dentin. It's likely to be the most common dental injury recorded.

An overview of the most frequent dental issues in children and the most efficient ways to treat them class II div 1 and the frequency of both complex and uncomplicated crown fractures in the upper anterior teeth will be examined in this study. As part of this study, researchers are attempting to identify and educate patients about trauma, its prevention, and its early management.[9,10] Dentists and surgeons routinely overlook the importance of providing patients with age-

appropriate therapy and early, correct diagnosis of their injuries. This study aims to change dentists' attitudes toward the early detection of the second most common cause of tooth decay.

MATERIAL AND METHODS

This cross-sectional study was conducted at Nishter Institute of Dentistry and comprised of 359 patients with 525 permanent teeth. Patients detailed demographics age,sex, type of damage sustained, presence or absence of class II Div 1 were recorded after taking informed written consent from the authority. neligible participants included children who were receiving or had completed orthodontic treatment, as well as children whose permanent anterior teeth had not yet emerged. It should be noted that this study did not include children whose permanent anteriors had been removed owing to caries or other causes other than trauma, as well as children who had partial or total anodontia affecting permanent anteriors.

Patients were between the ages of 7 and 12. Measurement of overjet in accordance with the 1997 WHO Basic Oral Health Survey Guidelines was carried out using a CPI probe. Data on the causes of dental damage and where it occurred were also gathered. For the purposes of this study, the WHO codes for traumatic dental injuries to the anterior teeth were employed in Andreasen's Epidemiological Classification. Using the 1997 WHO Basic Oral Health Survey Guidelines, a CPI probe was used to measure the level of overjet as specified. Prevalence of crown fracture was assessed. Complete data was analyzed by SPSS 24.0 version. Frequencies and percentages were used for categorical variables.

RESULTS

Majority of the patient was male 200 (55.7%) were males and 159 (46.3%) were females. Mean age of the patients were 8.64 ±12.37 years. Class II div 1 was present among 149 (34.2%) cases. Overjet ≤5 mm was found among 23 (6.4%) patients and ≥5 mm was among 155 (43.2%). (table 1)

Table 1: Baseline detailed demographics of enrolled cases

Variables	Frequency (359)	Percentage
Mean age (years)	8.64 ±12.37	
Gender		
Male	200	55.7%
Female	159	46.3%
Class II div 1		
Yes	149	34.2
No	210	65.8
Overjet		
≥5 mm	155	43.2
≤5 mm	23	6.4

Table 2: Causes of TDI among cases

Variables	Frequency	Percentage
Causes		
Falling	195	54.3
Sports	110	31.6
RTA	30	8.4
Physical violence	24	6.7
Total	359	100

Falling was the most common cause of injury found in 195 (54.3%) cases followed by sports 110 (31.6%), RTA was found in 30 (8.4%) and physical violence in 24 (6.7%). (table 2)

Frequency of crown fracture was found among 43 (11.98%) cases in which complicated crown fractures were 16 (4.5%) cases and the rest 27 (7.5%) were uncomplicated crown fractures. (table 3)

Table 3: Prevalence of crown fracture with respect to types

Variables	Frequency	Percentage
Crown fracture		
Yes	43	11.98
No	316	88.2
Types of Crown fracture		
complicated	16	4.5
uncomplicated	27	7.5

Among 43 cases of crown fractures majority of the cases were males 27 (62.8%). (table 4)

Table 4: Association of crown fracture with respect to gender

Crown fracture	Frequency (n=43)	Percentage
Gender		
Male	27	62.8
Female	16	37.2

Among 16 cases of complicated crown fractures most of the patients 14 (87.5%) received root canal treatment (RCT) and remaining 2 (12.5%) received pulpotomy while among patients of uncomplicated crown fractures seal with GIC was used among 19 (70.4%) and direct restration with composite was among 9 (29.6%) cases. (table 5)

Table 5: Management of treatment among crown fractures

Crown Fracture	Frequency	%age
Complicated		
RCT	14	87.5
Pulpotomy	2	12.5
Uncomplicated		
Seal with GIC	19	70.4
Direct restoration with composite	9	29.6

DISCUSSION

Dental injuries can have a significant impact on a child's quality of life because of pain, loss of function, and poor looks. Trauma-exposed children are both physically and psychologically affected. Between the ages of 11 and 14, the majority of children with oral trauma were affected. (19.1 % of). As people get older, they are more likely to suffer from multiple injuries, which may have a cumulative effect on their health. This reveals a buildup of treatment needs due to a lack of dental awareness, as documented in prior studies. [11,12] A common endodontic complication is the loss of pulp vitality, which was more prevalent in patients with additional luxation. [13]

In this cross-sectional study 359 patients of both genders with 525 permanent teeth were presented. Patients were aged between 7-12 years with mean age 8.64 ±12.37 years. Majority of the patients were males 200 (55.7%). These findings were comparable to the previous studies. Class II div 1 was present among 149 (34.2%) cases. Overjet ≤5 mm was found among 23 (6.4%) patients

and ≥5 mm was among 155 (43.2%).[16] Falling was the most common cause of injury found in 195 (54.3%) cases followed by sports 110 (31.6%), RTA was found in 30 (8.4%) and physical violence in 24 (6.7%). Previously many researches presented same findings that falling was the most common cause of traumatic dental injury among children with age group 5-15 years.[17,18] Home is where most children spend their time, followed by school, where they engage in a wide range of activities such as bicycle riding, bickering with their siblings, and so on. Games played during school lunch periods might cause stress due to the possibility of falling and fighting among friends. We must emphasise the importance of preventive education to parents, children, and school personnel. Schools should ensure that physical activity is supervised by sports teachers at all times, and appropriate preventive measures, such as helmets, protective mouth guards, and face masks, should be made mandatory. [19,20]

In our study frequency of crown fracture was found among 43 (11.98%) cases in which complicated crown fractures were 16 (4.5%) cases and the rest 27 (7.5%) were uncomplicated crown fractures. As previously reported by Ingle et al.[21] and Marcenes et al.[22], the prevalence of 11.5 percent was comparable (11.7 percent). It was discovered that the prevalence was higher when compared to previous study by David et al. (6.1 percent),[23] Tangade (4.41 percent),[24], and Gupta et al. (4.15 percent)[25], and lower when compared to previous research by Ravishankar et al. (15.1 percent) and Gupta et al. (4.15 percent) (13.8 percent). They noticed that when they examined the pattern of anterior tooth damage they discovered that the most common type of injury was simple crown fractures, which typically damaged only one tooth. TDI epidemiological investigations have found that this is true in the vast majority of cases.

Among 43 cases of crown fractures majority of the cases were males 27 (62.8%). In comparison to girls, boys were more likely to have TDIs. This finding has been confirmed in the majority of prior studies[26,27]. This may be due to the fact that boys participate in more athletic activities, choose more aggressive games, engage in more violent conduct, and participate in contact sports more frequently (with or without appropriate protection). On the contrary, other research show that tooth damage is becoming more common among girls as a result of their increased participation in sports and activities previously reserved for boys only. [28,29]

In this study, it was discovered that increased overjet was a significant independent risk factor for TDIs in the participants. TDIs were found to be more sensitive to permanent anterior teeth when overjet was increased, which was presumably the cause of the enhanced sensitivity. To summarize, early orthodontic treatment for overjet is critical in order to avoid the development of TMJ disorders. When compared to non-obese children, obese children had a higher prevalence of TDIs in this study, despite the fact that the difference was not statistically significant.

The planning of anterior tooth trauma prevention methods will be greatly enhanced by evaluating the particular characteristics and pattern of anterior tooth trauma, as well as its prevalence and risk factors. Furthermore, properly analysing people's indifference to oral trauma and its repercussions necessitates understanding the significant treatment negligence.[30]

CONCLUSION

We concluded in this study that the prevalence of crown fracture among TDI was 11.98% and majority among them was uncomplicated crown fractures. Preventive interventions are needed because of the high incidence of oral trauma. There needs to be a greater awareness among parents and children about the dangers of mouth trauma.

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