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Original Article

Frequency of Dental Injuries in Patients Reporting to the Armed Forces Institute of Dentistry

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ABSTRACT

Objective: To determine the frequency, cause and type of dental injury in patients reporting to Armed Forces Institute of Dentistry.

Study design: Cross-Sectional Survey.

Place and Duration of Study: Department of Operative Dentistry Armed Forces Institute of Dentistry, Rawalpindi, Pakistan, from Sep 2021 to Sep 2022.

Methodology: A questionnaire was filled out for 357 patients reporting dental injury, including the extent of hard and soft tissue injuries. The cause and place of injury occurred; investigations, the treatment provided by the treating dentists ranging from restoration to root canal, type and duration of splint were also recorded.

Results: In the current study, 189(52.9%) out of 357 children got injury due to falls to the playground and other places. Maxillary incisors were mostly affected, and 163(45.7%) children had complicated crown fractures. Rigid splinting was done in 39(70.9%) of root fracture cases, while flexible splinting was done in 162(53.6%) patients with complicated crown fracture cases and 81(26.8%) complicated crown fracture cases. In 72(88.8%) cases of uncomplicated crown fracture, indirect pulp capping was done, and in 67(41.1%) cases of complicated crown fracture, root canal treatment were done. Apexification was done in 28(68.3%) of avulsion cases.

Conclusion: Our survey showed that most injuries occurred at school and the roadside. Maxillary incisors are primarily involved with complicated crown fractures, which are effectively managed.

Keywords: Avulsion, Complicated crown fracture, Dental injury, Splinting.

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INTRODUCTION

Dental injuries affect all age groups but more youngsters and adolescents are affected.[1,2] The tooth most commonly affected are the upper front teeth, especially the central incisors.[3] Upper lateral incisors and the lower front teeth also show some frequency of injury.[4] However, upper central incisors are shown to be more affected owing to their significantly increased proclination compared to the rest of the teeth in both upper and lower arches.[5,6]

There are two types of dental injuries: uncomplicated (just enamel and dentine are affected) and complicated (pulp is involved).[7] The most frequent type is an uncomplicated crown fracture (29%), with severity ranging from enamel fracture to avulsion (18%).[8] WHO classify dental injury class I as involving only enamel, Class II injury as involving enamel and dentine, and Class III injury is defined as involving the pulp.[9]

Petti's global epidemiological study estimated the frequency of global dental injuries in primary and permanent dentition.[10] It concluded that over one billion people had suffered a dental injury, which would rank fifth on the list of the world's most common acute/chronic diseases and injuries. According to a study conducted in Pakistan, the nationwide frequency of dental injuries was (13.7%), and males were significantly more affected than females.[9] Studying the occurrence and etiopathogenesis of dental injury is crucial since it occurs so frequently and has a negative impact on people's quality of life. This study aimed to determine the frequency, cause and type of dental injury in patients reporting AFID.

METHODOLOGY

The cross-sectional surveywas conducted at the Department of Operative Dentistry and Endodontics, the Armed Forces Institute of Dentistry from September 2021 to September 2022 after the approval of the Institutional Review Board (IERB letter # 905/Trg-ABP1K2). The sample size was calculated using the WHO sample size calculator, taking and the reported frequency of dental injuries was (18.5%).[11]

Inclusion Criteria: Patients of either gender aged 5-55 years reporting to the outpatient department with any form of dental injury during our study were included in the study.

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Exclusion Criteria: Patients who did not consent to participate were excluded from the study.

Patients were examined by the principal investigator in the department of operative dentistry and endodontics AFID, and a self-administered questionnaire was filled in which, along with the extent of hard and soft tissue injuries, including that to periodontium and lips, palate and cheek, were recorded. The cause and place of injury occurred; investigations including radiographs and vitality testing; the treatment provided by the treating dentists ranging from restoration to root canal, type and duration of splint and treatment provided was also recorded.

Statistical Package for Social Sciences (SPSS) version 21.0 was used for the data analysis. frequencies and percentages were recorded for qualitative variables, while mean and standard deviation were estimated for quantities variables.

RESULTS

Out of 357 total patients, 281(78.7%) were male, and 76(23.3%) were females. In the current study, 66(18.5%) of participants experienced dental injury at home, compared to 116(32.5%) who were hurt on roadsides and 141(39.5%) who suffered at school. 147(41.2%) had injuries during road traffic accidents (RTA), 189(52.9%) had slipped and fallen, 10(2.8%) were involved in assaults. The two most frequently afflicted teeth were the right maxillary central incisor 101(28.3%) and the left maxillary central incisor 118(33.1%). The pain was the most common cause of chief complaints 304(85.2%), 186(52.1%) were reported immediately to OPD and 163(45.7%) had a complicated crown fracture (Table-I.)

In 273(76.5%) patients, mono angle PARG of the involved teeth was taken, while in only 10(2.8%), PARG with different angles was taken. In 341(95.5%), EPT was used to check vitality and 116(67.5%) of the teeth lost vitality, 241(71.1%) were associated with luxation, and 290(81.2%) with soft tissue injuries (Table-II).Table-III shows that rigid splinting was done in 39(70.9%) of root fracture cases. Flexible splinting was done in 162(53.6%) complicated crown fracture cases and 81(26.8%) complicated crown fracture cases. Table-IV shows that indirect pulp capping was done in 72(88.8%) cases of uncomplicated crown fracture, and in 67(41.1%) cases of complicated crown fracture, root canal treatment were done. Extraction was done in 17(35.4%) of root fracture cases. Apexification was done in 28(68.3%) of avulsion cases.

Table-I: Etio-pathogenesis of Dental Injuries (n=357)

Parameters	Categories	n(%)
Location	Home	66(18.5%)
	School	141(39.5%)
	Road side	116(32.5%)
	Other	34(9.5%)
Cause	Fall	189(52.9%)
	Assault	10(2.8%)
	RTA	147(41.2%)
	Para functional	01(0.3%)
	Medical Conditions	10(2.8%)
Tooth Number	Right Maxillary Central Incisor	101(28.3%)
	Right Maxillary Lateral Incisor	47(13.2%)
	Right Maxillary Canine	07(2.0%)
	Left Maxillary Central Incisor	118(33.1%)
	Left Maxillary Lateral Incisor	49(13.7%)
	Left Maxillary Canine	28(7.8%)
Chief Complaint	Pain	304(85.2%)
	Sensitivity	04(1.1%)
	Discoloration	0(0.0%)
	Chipped Off Tooth	49(13.7%)
	Mobility	00(0.0%)
Time of Report	Immediately	186(52.1%)
	12 Hours	123(34.5%)
	24 Hours	38(10.6%)
	When Symptoms Appeared	10(2.8%)
Type of Fracture	Uncomplicated Crown Fracture	81(22.7%
	Complicated Crown Fracture	163(45.7%)
	Root Fracture	48(13.4%)
	Avulsion	41(11.5%)
	Multiple Fractures	24(6.7%)

Table-II: Most Common Investigations (n=357)

Parameters	Categories	n(%)
Radiographic Assessment	PARG	273(76.5%)
	OPG	57(16.0%)
	PARG at Different Angles	10(2.8%)
	CBCT	17(4.8%)
Vitality Tests	Cold Test	11(3.1%)
	Hot Test	5(1.4%)
	EPT	341(95.5%)
Vitality Status	Vital	116(32.5%)
	Non Vital	241(67.5%)
Presence of Luxation	Yes	254(71.1%)
	NO	103(28.9%)
Soft Tissue Injuries	Yes	290(81.2%)
	NO	67(18.8%)

Table-III: Types of Splinting (n=357)

		Splints Provided	
		Rigid Splint	Flexible Splint
Type of Fracture	Uncomplicated Crown Fracture	0(0.0%)	81(26.8%)
	Complicated Crown Fracture	01(1.8%)	162(53.6%)
	Root Fracture	39(70.9%)	09(3.0%)
	Avulsion	04(7.3%)	37(12.3%)
	Multiple Fractures	11(20.0%)	13(4.3%)
	Total	55(15.40%)	302(84.59%)

Table-IV: Management of Dental Injuries (n=357)

Treatment	Types of Fracture						
	Uncomplicated Crown Fracture		Complicated Crown Fracture	Root Fracture	Avulsion	Multiple Fracture	Total
Restoration	8 (9.9%)	1(0.6%)	0		0	0	9(02.52%)
Indirect Pulp Cap	72(88.8%)	1(0.6%)	0		0	0	73(20.44%)
Direct pulp cap	0	1(0.6%	0		0	0	1(00.28%)
Partial pulpotomy	0	1(0.6%)	0		0	0	1(00.28%)
Full pulpotomy	0	21(12.1%)	2(4.2%)		0	0	23(06.44%)
Apexification	0	9(5.5%)	0		28(68.3%)	0	37(10.36%)
Revascularization	1(1.2%)	62(38%)	0		0	0	63(17.64%)
Root Canal treatment	0	67(41.1%)	13(27.1%)		11(26.8%)	20(83.3%)	111(31.09%)
Leave As such	0	0	16(33.3%)		0	0	16(04.48%)
Extraction	0	0	17(35.4%)		2(4.9%)	4(16.7%)	23(06.44%)
Total	81(22.69%)	163(45.66%)	48 (13.44%)		41(11.48%)	24(06.72%)	357(100%)

DISCUSSION

We conducted this survey at AFID Rawalpindi because it is a tertiary care hospital providing emergency treatment round the clock, so most dental injuries are referred there. This study concluded that males (78.7%) are at an increased risk of dental injuries than females (20.7%). This was in agreement with most of the previous studies.[12,13] This could be because males are more involved in sports, outdoor activities, road traffic accidents, and violence, with a higher risk of dental injuries, and girls are less involved and stay indoors because of the cultural setup in Pakistan. Different studies resulted in male preponderance in dental injuries as in this study. Dental injuries occurred most frequently at school (39.5%), followed by roadsides (32.5%) and homes (18.5%).[14,15]

The cause of the injury determines the extent of damage to the tooth and the associated tissues. According to this survey, falls (52.9%) and automobile accidents (41.2%) were the two most frequent causes of dental injuries. This concurs with the findings of previous study.[16] The results of this study also show that the maxillary right central incisor and maxillary left central incisor were the two most often afflicted teeth.[17] The fact that the maxillary central incisors are so prominent and exposed within the dental arch may explain why these teeth are frequently involved in dental injuries. Due to increased overjet in youngsters and maxillary prominence, severe dental injuries are more likely to involve the maxilla.[18]

Mostly the cases of injuries referred to tertiary care setup are complicated. These patients usually have severe symptoms, pain being the chief complaint which, according to our study, is (85.2%) of all the reported cases and chipped-off teeth being the second most common complaint, similar to previous studies.[19] One of the most important factors influencing the treatment prognosis is the immediate treatment after injury. The earlier the treatment is provided, the better the prognosis and survival of teeth.[20]

Oral injuries are acknowledged as a global public health issue requiring sufficient planning and measures to avoid them. Efficient and timely management of such injuries is required. Parents, physical instructors, and general mass should be educated to provide safety measures, first aid and timely checkup from dentists at places where oral injury events happen most frequently, such as at home, on roads or the playground.

Our survey was of a tertiary level hospital of the twin cities of Rawalpindi and Islamabad; a national level survey should have been planned, which results can help adopt preventive measures and organization of national level policies.

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CONCLUSION

Our survey showed that most injuries occurred at school and the roadside. Maxillary incisors are primarily involved with complicated crown fractures, which are effectively managed.

Conflict of Interest: None.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

NAR & QAA: Conception, study design, drafting the manuscript, approval of the final version to be published.

AM & MU: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

SFTZ & AY: Critical review, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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