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Original Research Article

Evaluation of Traumatic Dental Injuries in Preschool Children: A Clinical Study

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Abstract:

Background: There are a lot of studies in the literature related to dental traumatic injuries. However, most of such studies were carried out on individuals with low socio-economic level and in public clinics or in university clinics giving dental health services. The purpose of this study is to determine the type of traumatic dental injuries occurring in pre-school children of families with high socio-economic level applying to private dental clinics and to measure the incidence of such injuries, to determine the reasons and to assess the count of treatments carried out.

Methods: Clinical records of 68 patients in total between the ages of 0-5, 32 of whom were female and 36 of whom were male, having applied to a private dental clinic. Study duration is Two years. the data were obtained after retrospective assessment.

Results: While it was discovered that dental trauma occurred more frequently in male children(52.94%). An increase in the count of traumas was observed between the ages of 1 and 3 and there is a statistically significant relationship between age and frequency of dental trauma ($p<0.05$), The most common cause of trauma was determined to be "falling"(72.05%) both in females and males. While the type of dental trauma most frequently encountered was concussion(28.37%), the treatment most frequently conducted for deciduous teeth was determined to be "examination and monitoring"(36.48%).

Conclusions: The fact that similar findings were obtained in pre-school children in this study in a similar way to the ones in retrospective and prospective studies carried out in the past, it has been revealed that traumatic dental injuries must be assessed carefully during primary dentition and precautions must be taken before the occurrence of trauma, that when it occurs, it must be treated fast and accurately.

Keywords: Dental Trauma, Pediatric Dentistry, Retrospective Study, Injury, Preschool Children.

Introduction

While oral diseases and disorders affect small children negatively, trauma in childhood is encountered frequently in oral region.[1] While head trauma in pre-school children occurs at a rate of 40%, one-third of injuries occur in the facial region.[2] In this period, approximately 50% of children happen to have dental trauma before reaching school age[3], with more than 18% of traumas occurring including dental injuries.[4] In addition to the fact that traumatic dental injuries are regarded as an important dental health problem frequently requiring urgent treatment[2,5,6], quite commonly occurring in childhood and affecting the quality of life[7], it is stated that they must be regarded also as public health problem[8] not only due to their high prevalence but also due to their negative effects on life[9], such as making chewing harder, creating speech impediments, making people embarrassed during smiling[10] because teeth come in sight while doing so and also as the result of its high cost.[11] In addition to all such negativities, dental trauma causes pain and loss of function in deciduous teeth and affects the development of permanent teeth and occlusion. It may cause emergence of physical, emotional and behavioural problems in children, in their families or in their childminders as the result of this.[12] For this reason, factors causing the formation of traumatic dental injuries must be eliminated and alternatives of treatment for a fast and efficacious intervention must be developed and carried out in order for physical, emotional and behavioural problems not to emerge after trauma. There are studies in the literature carried out in the past expounding on the prevalence, the etiology, gender, the way trauma happened and treatments conducted.[7,13,14]

Nonetheless, it is observed that almost all such studies were carried out in regions with low socio-economic level and in university clinics, that few studies[15] were carried out in regions with high socio-economic level and in private dental clinics. The purpose of this study is to determine the type of traumatic dental injury occurring in the period of primary dentition in pre-school children of families with high socio-economic level applying to the private clinic for treatment and to measure its incidence, to determine predisposing factors, to assess treatments carried out together with the type of trauma and with the way it happened, to encourage preparation of curricula to lead the doctors and parents that will intervene after the occurrence of traumatic injury.

Material and Methods

Clinical records of 68 patients having applied to a private dental clinic in Darbhanga Bihar. were examined and the data was obtained after retrospective assessment.

Retrospective data was collected from forms of trauma in the form of a standard form containing information on age; gender; how, where and when the traumatic dental injury occurred; time having elapsed until the conduction of first treatment, the type of trauma and the treatment carried out, from clinical notes in patient records and from radiographic items, in a way that enables a separate piece of information for each different trauma. The classification created by World Health Organization(WHO) and modified by Andreasen and Andreasen[5] was used for traumatic dental injuries. Besides, because the system used allows the recording of multiple dental trauma episodes (MDTE), repeated trauma was recorded on the same form and assessed separately.

used to compare the means of multiple variables. An Independent-Samples T-test was used to compare the means of two variable, while Chi-Square test was used when proportions were compared. The level of statistical significance was chosen at $p< 0.05$.

Results

Throughout one-year monitoring, 68 children in total between the ages of 0-5, 32(47.06%) of whom were female and 36(52.94%) of whom were male, applied to our clinic due to traumatic dental injury. Dental trauma was detected in 74 deciduous teeth in total. While it was discovered that dental trauma occurred more frequently in male children(52.94%), no statistically significant difference was found ($p>0.05$). Based on the results attained, an increase is observed in trauma count between the ages of 1 and 3 and there is a statistically significant relationship between age and frequency of dental trauma($p<0.05$). Data on gender and age is presented in table 1. "Falling" was discovered to be the most common cause of trauma(72.05%) both in females and males, in primary and permanent dentition. There is a statistically significant difference ($p<0.05$). The relationship between reasons for trauma and gender is shown in table 2. When the site of injury is examined, it is observed that all children aged 1 get injured at home, that children aged 3 and 4 get injured often in a playground (19.11% and 13.23%), that children aged 5 mostly have traumatic dental trauma in a day care center (7.35%). The relationship between the site of injury and age is shown in table 3. Children were also assessed in the study for general problems of health and 5(7.35%) children were discovered to be physically or mentally-disabled, 2(2.70%) children were discovered to be suffering from epilepsy, 8(10.81%) children were discovered to be receiving treatment due to hyperactivity. When the assessment is made in terms of the duration having elapsed between the occurrence of trauma and time of treatment, it was determined that the rate of patients applying for treatment on the same day was 35.29%, that the rate of patients applying within "1-3 days" was 45% and that the rate of those applying after over 1 year was 13.23%. Data is shown in table 4. While the most frequently-occurring type of dental trauma is concussion(28.37%), subluxation(20.27%) ranks the second. It was determined that the treatment conducted most frequently in deciduous teeth was "examination and monitoring" (36.48%), composite restoration ranked the second (35.13%), tooth extractions ranked the third with a rate of 22.97%. Types of dental trauma and data on the distribution of restorations carried out are shown in table 5.

Table 1

Age	Girl	Boy	Total
1	3(4.41%)	2(2.94%)	5(7.35%)
2	9(13.23%)	8(11.76%)	*17(25%)
3	9(13.23%)	12(17.64%)	*21(30.88%)
4	6(8.82%)	9(13.23%)	15(22.05%)
5	5(7.35%)	5(7.35%)	10(14.70%)
	32(47.05%)	36(52.94%)	68(100%)

Table 2: Relationship between reasons for trauma and gender

Reasons	Girl	Boy	Total
Crushing	6(8.82%)	11(16.17%)	17(25%)
Falling	24(35.29%)	25(36.76%)	*49(72.05%)
Traffic accident	2(2.94%)	0(0%)	2(2.94%)

Table 3: Relationship between the site of injury and age

Site of injury	1	2	3	4	5	Total
Home	5(7.35%)	8(11.76%)	5(7.35%)	2(2.94%)	1(1.47%)	21(30.88%)
Playground	0	6(8.82%)	13(19.11%)	9(13.23%)	4(5.88%)	*32(47.05%)
Day care center	0	1(1.47%)	2(2.94%)	3(4.41%)	5(7.35%)	11(16.17%)
Other	0	2(2.94%)	1(1.47%)	1(1.47%)	0	4(5.88%)

Table 4: Having elapsed between the occurrence of trauma and time of treatment

Time	n (%)
0-24 hours	24(35.29%)
1-3 day	*31(45.58%)
1 week	1(1.47%)
1 month	1(1.47%)
3 month	0(0%)
6 month	2(2.94%)
1 year+	9(13.23%)

Table 5: Types of dental trauma and data on the distribution of restorations

Concussion	21(28.37%)	Examination	27(36.48%)
Subluxation	15(20.27%)	Composite restoration	17(22.97%)
Lateral luxation	5(6.75%)	Endodontic theraphy	10(13.51%)
Intrusive luxation	9(12.16%)	Extraction	20(27.02%)
Extrusive luxation	3(4.05%)		
Avulsion	2(2.70%)		
Enamel fracture	12(16.21%)		
Dentin enamel fracture	5(6.75%)		
Pulp exposure	2(2.70%)		

Discussion

Traumatic dental injuries are complex, expensive injuries leaving irreversible sequelae, requiring treatment for the patient just at the beginning of his/her life.[5,6] It is observed that traumatic dental injuries occurring in pre-school children are more momentous because they leave periapical sequelae in primary dentition, affect development of permanent teeth, have a negative effect on the development of occlusion.[16] For these reasons, it is clearly emphasized in the studies carried out that injuries in deciduous teeth should be paid more careful attention to than those in permanent teeth should.[17,18] There are a lot of studies speculating that the gender difference plays a role in traumatic dental injuries occurring in pre-school children, that the rate of occurrence of traumas to males is high.[5,19-21] On the other hand, there are also a lot of studies in the literature that speculate that there is no gender difference in traumatic dental injuries occurring in pre-school period.[17,22,23] Considering the data obtained in the study we carried out, the number of males was found to be higher(52.94%) although it was not a statistically significant difference. Nevertheless, while it was observed that the numbers of females and males were almost equal in dental injuries occurring in the period up to 3 years of age (21 girls-22 boys), it was determined that there was an increase in the count of trauma in male children after 3 years of age (11 girls-14 boys). We are of the opinion that this situation emanates from the fact that such behavioural tendency problems in male children around 4 years of age [24] as aggressiveness, hyperactivity, an increase in the instinct to be dominant emerge. When the relationship of age with traumatic dental injuries in deciduous teeth is examined, it is seen that children between the ages of 12-36 months bear grave risk in terms of trauma. Traumatic dental injuries occur more frequently in this period because of the fact that this age range is a period when children start to walk and fall down very frequently, that motor coordination is low in this period.[25,26] In a similar way to the findings in studies[8,21] conducted, it was found also in this study that a lot of children(60.81%) between the ages of 12-36 months are brought to the clinic because of trauma.

Although age and gender difference have been shown as predisposing factors for a long time information of dental trauma in deciduous teeth, other factors have also been shown to be influential.[8] The type of activity at the moment of the accident; biological, environmental, behavioural and socio- economic factors can be specified among other factors.[6] When the way that dental injury has occurred is examined, it is seen that it mostly stems from falling down (72.05%), that this result is in agreement with the results in similar studies.[27,28] When the site of injury was examined, it was found that while injuries in children over 3 years of age occurred mostly in places where collective activities were done such as playgrounds, day care centers, it was found that they occurred mostly at home in children under 2 years of age. These results are similar to the results attained in studies in Sweden that traumatic dental injuries occurring around 1 year of age occur mostly at home. What is also specified among factors causing traumatic dental injuries is excess overjet, anterior open bite, inadequate lip coverage, behavioural disorders, systemic problems, socio-economic standing[21], attention deficit, hyperactivity disorder. Behavioural disorders, emotional stress, learning disability, disease and physical disturbances not only increase prevalence of traumatic dental injuries but also paves the way for recurrent trauma.[6] In another study carried out, it was discovered that obese children experienced trauma 2.5 times more than non-obese children did. In our study, despite the fact that it was found that 11% of children were disabled or had a disturbance that would affect general health, there is no data to compare the relationship between obesity and traumatic dental injury. The average application duration is seen to be very different in studies where the period between the trauma and applying to a dentist was measured.[8,19] The reason for this is specified as not attaching importance to dental trauma, the difficulty of having access to a dentist, the fact that priority is given to other injuries that occur together with dental injury. The rate of application in the first 24 hours after the trauma was calculated to be 35.29%; the rate of application within 1-3 days was calculated as 45.58% in our study. We are of the opinion that the fact that the application period after trauma is between 1-3 days is due to the fact that priority is given to other injuries in the case of existence of other injuries together with dental trauma or the fact that the family want the treatment of the child to be conducted by a pediatric dentist. Besides, the analyses of data must be carried out in accordance with the location of the study. Data may vary depending whether it is data from a hospital, or from a private clinic or a university clinic. For example, Andreasen has found that luxation injury is the most frequently-occurring type of trauma through data from both hospitals and pediatric dental clinics in universities of Haavikko and Rantanen.[18] Garcia Godoy et al. have reported that concussion injury occurs more based on data from a private clinic. Similarly, concussion injury was discovered to be more in count also in this study. This situation may be interpreted in the way that private clinics are preferred because mild traumas such as concussion or subluxation aren't reported as the result of the fact that they recover quickly and they aren't paid attention to by parents or because having access to hospitals or pediatric dental clinics of universities by patients is hard.

Conclusion

Traumatic dental injury is a complex, expensive health problem occurring quite frequently, often requiring urgent treatment, having negative effects on life. It is regarded as a public health problem not only because of the emergence of some problems such as difficulty in chewing, progress of speech impediments, feeling embarrassed while smiling since teeth come in sight in children in pre-school period, while it affects other children more frequently, but also because of the fact that it leaves sequelae that will affect deciduous and permanent dentition and because of its negative effects on occlusion development. It has been revealed that traumatic dental injury needs to be paid careful attention to in decudious dentition and that precautions must be taken before the occurrence of trauma, that it needs to be treated fast and accurately after trauma occurs while similar findings were reached also in this study to those obtained in the past in retrospective and prospective studies.

References

1. Abanto J, Carvalho TS, Mendes FM, Wanderley MT, Bönecker M, Raggio DP. Impact of oral diseases and disorders on oral health-related quality of life of preschool children. Community Dent Oral Epidemiol. 2011; 39:105–14.
2. Flores MT. Guidelines for the management of traumatic dental injuries. III. Primary teeth. Dental Traumatol 2007; 23:196–202.
3. Andreasen JO, Andreasen FM. Dental traumatology: quo vadis. Endod Dent Traumatol 1990; 6:78–80.
4. Eilert-Petersson E, Andersson L, Sörensen S. Traumatic oral vs non-oral injuries. An epidemiological study during one year in a Swedish county. Swed Dent J 1997; 21:55–68.
5. Andreasen JO, Andreasen FM. Textbook and color atlas of traumatic injuries to the teeth, 3rd edn. Copenhagen: Munksgaard. 1994. 151–80.
6. Glendor U. Epidemiology of traumatic dental injuries – a 12-year review of the literature. Dent Traumatol 2008; 24:603–11.
7. Cortes MI, Marcenes W, Sheiham A. Impact of traumatic injuries to the permanent teeth on the

oral health-related quality of life in 12–14-year-old children. Community Dent Oral Epidemiol 2002; 30:193–8.
8. de Amorim Lde F, da Costa LR, Estrela C. Retrospective study of traumatic dental injuries in primary teeth in a Brazilian specialized pediatric practice. Dental Traumatology 2011; 27: 368–373.
9. Berger TD, Kenny DJ, Casas MJ, Barrett EJ, Lawrence HP. Effects of severe dentoalveolar trauma on the quality-of-life of children and parents. Dental Traumatol 2009; 25:462–9.
10. Marcenes W, Al Beiruti N, Tayfour D, Issa S. Epidemiology of traumatic injuries to the permanent incisors of 9–12-year-old schoolchildren in Damascus, Syria. Endod Dent Traumatol 1999; 15:117–23.
11. Borum MK, Andreasen JO. Therapeutic and economic implications of traumatic dental injuries in Denmark: an estimate based on 7549 patients treated at a major trauma centre. Int J Paediatr Dent 2001; 11:249–58.
12. Sennhenn-Kirchner S, Jacobs HG. Traumatic injuries to the primary dentition and effects on the permanent successors – a clinical follow-up study. Dent Traumatol 2006; 22:237–41.
13. Altun C, Ozen B, Esenlik E, Guven G, Gurbuz T, Acikel C et al. Traumatic injuries to permanent teeth in Turkish children, Ankara. Dent Traumatol 2009; 25:309–13.
14. Zuhal K, Semra OE, Huseyin K. Traumatic injuries of the permanent incisors in children in southern Turkey: a retrospective study. Dent Traumatol 2005; 21:20–5.
15. Marcenes W, Zabote NE, Traebert J. Socio-economic correlates of traumatic injuries to the permanent incisors in schoolchildren aged 12 years in Blumenau, Brazil. Dent Traumatol 2001; 17:222–6.
16. Von Arx T. Developmental disturbances of permanent teeth foolowing trauma to the primary dentition. Aust Dent J 1993; 38:1-10.
17. Andreasen JO, Ravn JJ. Epidemiology of traumatic dental injuries to primary and permanent teeth in a Danish population sample. Int J Oral Surg 1972; 1:235- 9.
18. Haavikko K, Rantanen L. A follow-up study of injuries to permanent and primary teeth in children. Proc Finn Dent Soc 1976; 72:153-62.
19. Eyuboglu O, Yilmaz Y, Zehir C, Sahin H. A 6-year investigation into types of dental trauma treated in a paediatric dentistry clinic in Eastern Anatolia region, Turkey. Dent Traumatol 2009; 25:110–4.
20. Al-Jundi SH. Dental emergencies presenting to a dental teaching hospital due to complications from traumatic dental injuries. Dent Traumatol 2002; 18:181–5.
21. Robson F, Jorge MLR, Bendo CB, Vale MP, Paiva SM, Pordeus IA. Prevalence and determining factors of traumatic injuries to primary teeth in preschool children. Dent Traumatol 2009; 25:118–22.
22. Kramer PF, Zembruski C, Ferreira SH, Feldens CA. Traumatic dental injuries in Brazilian preschool children. Dent Traumatol 2003; 19:299–303.
23. Hargreaves JA, Cleaton-Jones PE, Roberts GJ, Williams S, Matejka JM. Trauma to primary teeth of South African preschool children. Endod Dent Traumatol 1999; 15:73–6.
24. Scerbo S, Kolko DJ. Salivary testosterone and cortisol in disruptive children: relationship to aggressive,
25. hyperactive, and internalizing behaviors. Journal of The American Academy of Child and Adolescent Psychiatry 1994; 33:1174–1184.
26. Harrington MS, Eberhart AB, Knapp JF. Dentofacial trauma in children. J Dent Child 1988; 55:334–8.
27. O'Neil DW, Clark MV, Lowe JM, Harrington MS. Oral trauma in children: a hospital survey. Oral Surg Oral Med Oral Pathol 1989; 68:691–6.
28. Rajab LD. Traumatic dental injuries in children presenting for treatment at the Department of Pediatric Dentistry, Faculty of Dentistry, University of Jordan,1997-2000. Dental Traumatology 2003;19: 6–11.