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Original Research Paper

Dental Science

ETIOLOGICAL FACTORS RELATED TO TRAUMATIC INJURIES OF PERMANENT TOOTH

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ABSTRACT Traumatic Dental Injuries (TDI) are a common cause of tooth damage and tooth loss in different age groups. The aetiology of traumatic dental injuries is widely distributed. During the past 30 years, the number of aetiologies of traumatic dental injuries (TDIs) has increased dramatically in the literature and now includes a broad spectrum of variables, including oral and environmental factors and human behavior Prevention of diseases and injuries is a field of priority for the health authorities.

KEYWORDS : Injuries, Tooth, Protrusion, Accidents

INTRODUCTION:

Traumatic dental injuries are more prevalent in permanent (58.6%) than in primary dentition where they constitute 36.8%.[1-2] Traumatic dental injuries result from either direct or indirect impact. The extent of the damage is related to energy of impact, resilience and shape of the impacting object, direction of the impact and the reaction of the tooth surrounding tissues. Oral factors (increased over jet with protrusion), environmental determinants and human behavior (risk-taking children, children being bullied, emotionally stressful conditions, obesity and attention deficit hyperactivity disorder) were found to increase the risk for TDIs.[3]

Skaare And Jacobsen (2003)[4] reported that 8% of all TDIs in the age group 7– 18 years were due to sport activities, representing 16% of TDIs in leisure time. More than half (59%) of the TDIs were related to ball sports and 40% of sports accidents in girls were sustained in team handball. TDIs that are due to traffic accidents occurred in 10% of all injured individuals, especially in teenagers in urban areas; 8% of TDIs were contributed to violent acts and occurred more frequently in urban areas.

Uji and Teramoto (1988)[5] in Japan reported sports to be among the main causes of TDIs in teenagers. In yet another study **Marcenes et al. (2000)**[6] found an almost equal occurrence of TDIs resulting from sports(19%) and violence (16%). **Nicolau et al.(2001)**[7] though to a much lesser extent (2% and 1.5%) for sports activities and violence respectively). In the **Nicolau et al.(2001)**[7] study the proportion of unknown causes of TDIs was 40%.

PREDISPOSING FACTORS:

There are some of the predisposing factors also which are responsible for traumatic dental injuries:

1.Protrusion of upper incisors.
2.Insufficient lip closer.
3.Overjet exceeding 4 mm.
4.Mouth breathing.

Among the earliest causes of TDIs described in the literature are increased overjet with protrusion and inadequate lip coverage. Even among children younger than 5 years of age, anterior open bite has recently been found to result in twice as many TDIs when compared with their counterparts.[3]

The Swedish Council on Technology Assessment in Health Care (SBU) presented a systematic overview in 2005 of the literature and concluded that there is an increased risk of a TDI to the Upper front teeth if the patient has a pronounced over jet with protrusion in combination with inadequate lip coverage.[8]

Shulman and Peterson (2004)[9] reported that after adjusting for age, gender and race-ethnicity, over jet was the only occlusal covariate significantly associated with maxillary incisor trauma, with the odds of trauma increasing markedly as overjet increased.

Causes[10] Of Traumatic Dental Injuries:

1.Iatrogenic injuries in new born.
2.Fall in infancy.
3.Child physical abuse.
4.Falls and collisions.
5.Sports.
6.Bicycle injuries.
7.Automobile injuries.
8.Assaults.
9.Torture.
10. Mental retardation.
11. Epilepsy.
12. Drug related injuries.
13. Inappropriate use of teeth.

1. Iatrogenic Injuries In New Born:

Prolonged pressure of tubes against the maxillary alveolar process during prolonged intubation has shown high frequency of developmental enamel defects in primary dentition.

2.Fall In Infancy:

Dental injuries are infrequent during first year of life, but increases substantially with effort of child to move about, further increases as child begins to walk and tries to run. The incidence reaches its peak just before school age and consists mainly of injuries due to fall and collision.

3. Child Physical Abuse:

The over representation of accidents at home may be related to the difficulty in assessing injuries associated with child and elderly physical abuse. The face is a common target in assault. Cause of oral injuries in children is manifested in the battered child syndrome, a clinical condition in infants who have suffered serious physical abuse.

Da Fonseca et al.(1992)[11] found that 75% of all children subjected to physical abuse and taken to a major country hospital in the USA suffered injuries to the head, face, mouth or neck. **Bewly et al. (1997)**[12] estimated that women, on average, experienced 35 episodes of domestic violence

before seeking professional help. **Cairns et al.(2005)**[13] have recently confirmed this finding by showing that, although in 28% of cases dental practitioners suspected abuse, they sought advice and help in only 8% of the cases.

4.Falls And Collision:
Occur due to sport injuries in playground and are characterized by high frequency of crown fracture. Falls, collisions and being struck by an object are the major causes of TDIs. The home and its neighborhood are the most common place of injury in preschool and school-aged children, whereas physical leisure activities, violent incidents and traffic accidents account for most TDIs among adolescents.[3]

Odoi et al.(2002)[14] demonstrated that children who were being picked on or bullied by other children experienced more dental traumas than other children. On the other hand, children with prosocial behavior were less injured with TDIs, **Lalloo**[15] reported that hyperactive children were injured more often than non-hyperactive children, whereas **Odoi et al.** found no such relationship. The difference may be that the environment plays a more important role than human behavior in the sense that a hyperactive child can express his or her hyperactivity with less risk if the environment is safe. **Wazana**[16] stressed the importance of modifying the environment in order to reduce injuries among children.

5.Bicycle Injuries: Bicycle injuries results in trauma to both hard and soft tissue due to high velocity at the time of impact. **Acton et al.(1996)**[17] reported that 31% of children under the age of 15 years with facial injuries as a result of bicycle accidents had a TDI. **Thompson et al. (2003)**[18] noted that bicycle helmets reduce the risk of facial injuries by 65%, but the users are still at high risk of dental trauma because of lack of protection of the lower face and jaw. **Chapman And Curran(2004)**[19]concluded that wearing bicycle helmets not only reduces the incidence and severity of head and brain injuries and their long term consequences but also decreases facial injuries and some dental trauma.

6. Sports: Injuries during teenage is due to sports. This especially applies to contact sports, such as ice hockey, soccer, baseball, basketball and wrestling. Amateur athletes more often suffer from maxilla facial injuries than professional athletes. **Mourouzis and Koumoura (2005)**[20] showed that only10%of the patients suffering from maxillofacial injuries during sports were professional athletes and **Ueeck et al. (2004)**[21] found that only 15% of the patients who suffered from maxillofacial injuries related to interaction with horses were injured during competition or work.

Recently, a US Department of Health and Human Services report indicated that approximately 33% of all TDI episodes and up to 19% of injuries to the head and face were sports related. **Tuli et al.(2005)**[22] reported that 32.2% of patients with a TDI visiting a university clinic did so because of sports injuries.

Federation Dentaire International places organized sports into two categories based on risk of TDI: High-risk sports (such as American football, hockey, ice hockey, lacrosse, martial sports, rugby, inline skating, skate boarding and mountain biking) and medium-risk sports (such as basketball, soccer, team handball, diving, squash, gymnastics, parachuting and water polo).Horse riding is a popular activity, but one that is relatively dangerous. Injuries in connection with handling of horses are frequent and sometimes very severe.

Ueeck et al. (2004)[21] found that horse riding and facial injuries were often associated with other types of injury. Therefore, one way to show TDIs in connection with horse riding is to show injuries to the head. In two national surveys, head injuries in association with horse riding occurred in 20.0–23.2% of the cases.

7. **Automobile Injuries**: Such injuries are seen in late teenagers group. The front seat passengers are more prone to facial injuries. **Gassner et al.(2004)**[23] recently showed that children in traffic accidents have a more than two fold risk of facial bone fractures when compared with other injury types. A study in Nigeria reported that rear seat occupants of commercial vehicles were the most likely to sustain maxillofacial injuries

Roccia et al.[24] and **Mouzakes et al.(1999)**[25] demonstrated that new types of facial trauma occur from airbag explosion in cars. **Cox et al.(2004)**[26] reported that front seat occupants in the USA restrained with a seat belt only or a seat belt and an air bag showed a significantly reduced risk of facial injury when compared with completely unrestrained occupants.

8.Assaults:This type of trauma is characterized by luxation and avulsion of teeth as well as fracture of root and supporting bone.Injuries from fight are more prominent in older age groups and closely related to alcohol abuse.

Violence often results in maxillofacial injuries. In a study in the UK 62% of all injuries to the face were due to assaults.[27] In a Finnish study, the authors suggested that the incidence of maxillofacial fractures resulting from assaults is unlikely to increase.[28] The same study reported that violence between individuals increased in severity from 1981 to 1997. In 1981, nearly30% of assaults from kicking resulted in maxillofacial fracture; in 1997, this rate increased to 40%.

Acts of violence were more frequently observed in the city when compared with rural areas and increased with age. In 16 to 18 year olds violence was recorded as the direct cause in 23% of the injured individuals.

9. Torture: A disgraceful and apparently increasing type of injury in represented by trauma to oral and facial region of tortured prisoners. The most common type of torture was beating, which resulted in loosening, avulsion or fracture of teeth and soft tissue laceration. The use of torture is of growing concern with the face as a common target area. Data on torture are scarce, but working groups of dentists and physicians in co-operation with Amnesty International have been formed to document torture.

10.Mental Retardation:High frequency of dental injuries has been found among such patients, a phenomenon probably related to lack of motor coordination, crowded condition in institutions or epilepsy.

11.Epilepsy: Such patients represent special risks and problems with regard to dental injuries. **Bessermann (1978)**[29]reported that 52% of epileptic patients had suffered dental trauma, many of which were of a repetitive nature. Epileptic seizures have been shown to be the third most common medical incident in dental surgeries.

The prevalence of TDIs in a group of individuals with cerebral palsy (CP) has been found to be much higher (57%) than in healthy populations despite that CP individuals do not take part in violent sport activities as do healthy individuals. Uncontrolled head movements seemed to be a more important factor causing a TDI among CP individuals than increased overjet.

12. Drug Related Injuries: It is reported that drug addicts

suffer from crown fractures of molars and premolars, apparently resulting from violent tooth clenching 3 to4 hours after drug intake. Upto 5 or 6 fractured teeth have been found in the same individual.

13. Inappropriate Use Of Teeth: Many individuals have injured their teeth when using them as a tool to open hair clips, fix electronic equipment, cut or hold objects or opening bottles of soda or beer. **Malikaew et al.(2006)**[30] found that 18.7% of TDIs were caused by inappropriate use of teeth. Others have also reported this phenomenon though the figures were lower: **Nicolau et al. (2003)**[7] (6%),**Tapias et al.**[31] (8.5%).

CONCLUSION:

The number of known causes of TDIs presented in the literature has grown to alarming levels during the past few decades. The reason for this phenomenon probably lies in an increased interest of the causes, but also to show the complexity underlying a TDI. It is not, e.g. overjet and lip coverage alone that increases the risk for TDIs. Instead, it is a complex interaction between the patient's oral situation, the design of public parks and school playgrounds and human behavior. Studies in dental traumatology, therefore, have to consider a number of parameters, including oral predisposing factors, environmental determinants and human behavior to determine why TDIs come about and how they should be prevented. The question is to what extent these factors together or separately influence the risk of a TDI.[3]

REFERENCES

1. Marcenes W, Al Beiruti N, Tayfour D, Issa S. Epidemiology of dental injuries to the permanent incisors of 9-12-year-old schoolchildren in Damascus, Syria. Endod Dent Traumatol 1999;15:117-23.
2. Granville-Garcia AF, de Menezes VA, de Lira PIC. Dental trauma and associated factors in Brazilian preschoolers. Dent Traumatol 2006;22:318-22.
3. Ulf Glendor etiology and risk factors related to traumatic dental injuries Dental Traumatology 2009; 25: 19–31.
4. Skaare AB, Jacobsen I. Etiological factors related to dental injuries in Norwegians aged 7–18 years. Dent Traumatol 2003;19:304–8.
5. Uji T, Teramoto T. Occurrence of traumatic injuries in the oromaxillary region of children in a Japanese prefecture. Endod Dent Traumatol 1988;4:63–9.
6. Marcenes W, Alessi ON, Traebert J. Causes and prevalence of traumatic injuries to the permanent incisors of school children aged 12 years in Jaragua do Sul. Brazil Int Dent J 2000;50:87– 92.
7. Nicolau B, Marcenes W, Sheiham A. Prevalence, causes and correlates of traumatic dental injuries among 13-year-olds in Brazil. Dent Traumatol 2001;17:213–7.
8. Holm AK, Axelsson S, Bondemark L, Brattstro¨m V, Hansen K, Marke´ LA° et al. Bettavvikelserochtandreglering i ett ha¨lsoperspektiv. En systematisklitteraturo¨ versikt. SBU Statensberedningfo¨ r medicinskutva¨ rdering (The Swedish Council on Technology Assessment in Health Care). Stockholm: SBU; 2005.
9. Shulman JD, Peterson J. The association between incisor trauma and occlusal characteristics in individuals 8–50 years of age. Dent Traumatol 2004;20:67–74.
10. Andreasen JO, Andreasen FM, Andersson L. Textbook and colour atlas of traumatic injuries to the teeth. 3rded. Copenhagen, Denmark: Munksgaard; 1994.
11. Da Fonseca MA, Feigal RJ, ten Bensel RW. Dental aspects of1248 cases of child maltreatment on file at a major country hospital. Pediatric Dent 1992;14:152–7.
12. Bewly S, Friend J, Mezey G. Violence against women. London: Royal College of Obstetricians and Gynaecologists. Study Group, 1997.
13. Cairns AM, Mok JY, Welbury RR. The dental practitioner and child protection in Scotland. Br Dent J 2005;199:517–20.
14. Odoi R, Croucher R, Wong F, Marcenes W. The relationship between problem behavior and traumatic dental injury amongst children aged 7–15 years old. Community Dent Oral Epidemiol 2002;30:392–6.
15. Lalloo R. Risk factors for major injuries to the face and teeth. Dent Traumatol 2003;19:12–4.
16. Wazana A. Are there injury-prone children? A critical review of the literature. Can J Psychiatry 1997;42:602–10.
17. Acton CH, Nixon JW, Clark RC. Bicycle riding and oral/ maxillofacial trauma in young children. Med J Aust 1996;165:249–51.
18. Thompson DC, Rivara FP, Thompson R. Helmets for preventing head and facial injuries in bicyclists (Cochrane review). The Cochrane library, Issue 1, Oxford: Update Software; 2003.
19. Chapman HR, Curran AL. Bicycle helmets – does the dental profession have a role in promoting their use? Br Dent J 2004;196:555–60; discussion 539.
20. Mourouzis C, Koumoura F. Sports-related maxillofacial fractures: a retrospective study of 125 patients. Int J Oral Maxillo facSurg 2005;34:635–8.
21. Ueeck BA, Dierks EJ, Homer LD, Potter B. patterns of maxillofacial injuries related to interaction with horses. J Oral Maxillofacial Surg 2004;62:693-6.
22. Tuli T, Hachl O, Rasse M, Kloss F, Gassner R. Dentoalveolartrauma. Analysis of 4763 patients with 6237 injuries in10 years. Mund Kiefer Gesichtschir 2005;9:324–9.
23. Gassner R, Tuli T, Hachl O, Moreira R, Ulmer H. Cranio-maxillo-facial trauma in children: a review of 3,385 cases with 6,060 injuries in 10 years. J Oral MaxillofacSurg 2004;62:399– 407.
24. Roccia F, Servadio F, Gerbino G. Maxillofacial fractures following airbag deployment. J Cranio maxilla fac Surg 1999;27:335–8.
25. Mouzakes J, Koltai PJ, Kuhar S, Bernstein DS, Wing P, Salsberg E. The impact of airbags and seat belts on the incidence and severity of maxillofacial injuries in automobile accidents in New York State. Arch Otolaryngol Head Neck Surg 2001;127:1189–93.
26. Cox D, Vincent DG, McGwin G, MacLennan PA, Holmes JD, Rue LW 3rd. Effect of restraint systems on maxillofacial injury in frontal motor vehicle collisions. J Oral MaxillofacSurg 2004;62:571–5.
27. Dimitroulis G, Eyre J. A 7-year review of maxillofacial trauma in a central London hospital. Br Dent J 1991;170: 300–2.
28. Kontio R, Suuronen R, Ponkkonen H, Lindqvist C, Laine P. Have the causes of maxillofacial fractures changed over the last 16 years in Finland? An epidemiological study of 725 fractures Dent Traumatol 2005;21:14–9.
29. Bessermann K. Frequency of maxillo-facial injuries in a hospital population of patients with epilepsy. Bull Nord Soc Dent Handicap 1978;5:2–26.
30. Malikaew P, Watt RG, Sheiham A. Prevalence and factors associated with traumatic dental injuries (TDI) to anterior teeth of 11–13 year old Thai children. Community Dent Health 2006;23:222–7.
31. Tapias MA. Prevalence of traumatic crown fractures to permanent incisors in a childhood population: Mostoles, Spain. Dent Traumatol 2003;19:119–22.