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Prevalence Of Traumatic Dental Injuries In Presence Of Oral Habits Among Preschoolers -an Institutional Based Retrospective Study.

ASHFAQ AHMED M[1], DEEPA GURUNATHAN[2*], SARAVANA DINESH.S.P[3]

[1]Saveetha Dental college and Hospital,Saveetha institute of Medical and Technical Sciences, Saveetha university
[2]Professor and Head,Department of Pediatric and Preventive Dentistry,Saveetha Dental college and Hospital, Saveetha institute of Medical and Technical Sciences,Saveetha university
[3]Professor and Head,Department of orthodontics and Dentofacial Orthopedics,Saveetha Dental college and Hospitals,Saveetha institute of Medical and Technical Sciences,Saveetha University
*Corresponding Author
Email :151501059.sdc@saveetha.com[1], deepag@saveetha.com[2], saravanadinesh@saveetha.com[3]

Abstract: Traumatic dental injuries are most frequent during the first 10 years of life, it decreases with increase in age, and are very rarely seen after the age of 30. Etiologic factors are very much linked to falls due to accidents or steps are the most common cause of oral injuries. The management of traumatic dental injuries to the primary teeth differs from that used for permanent dentition. There is a close relationship between the apex of the root of the injured primary tooth and the underlying permanent tooth germ. Thus the aim of the study is to analyse the prevalence of traumatic dental injuries in primary teeth among children in the age group of 1-6 years. A retrospective analysis was done using dental archiving software present in the department of pedodontics where patients intraoperative photographs were checked for cross verification. The graphs and tables were done using SPSS software version 23 and chi square test was done. The results of the study showed that higher prevalence of traumatic dental injury was seen in females (25%) when compared to males ($p>0.05$), statistically not significant. Subjects with avulsion(33.33%) had oral habits of mouth breathing and subjects took minimum 1 day (16.67%) to report for treatment ($p>0.05$) statistically not significant.

Keywords: Avulsion, Dental injury, Primary teeth, Reimplantation, Trauma.

INTRODUCTION

Oral health plays a very important role in the general well-being of individuals, and parents' behavior and attitudes influence the oral health of their children.(Gurunathan and Shanmugaavel, 2016) Traumatic dental injuries are most frequent during the first 10 years of life, it decreases with increase in age, and are very rarely seen after the age of 30 (Petersson, Andersson and Sörensen, 1997). Injuries to the oral cavity comprise 1% of the total body area but it accounts for 5% of overall bodily injuries (Andersson, 2013). Of all patients seeking treatment for injuries, dental injuries are the most common and are seen in as many as 92% of patients presenting with oral injuries, whereas soft-tissue injuries to the same patients are seen in 28%, often simultaneously with dental injuries. Fractures occurring in the jaw are observed in rare condition with only 6% of all patients presenting with oral injuries. Dental trauma is more time-consuming and expensive to treat than many other outpatient accidental injuries (Andersson, Kahnberg and Anthony Pogrel, 2012).

Etiologic factors are very much linked to the age of the patient. In preschool children, falls due to accidents or steps are the most common cause of oral injuries, whereas in school age children, injuries are most often caused by sports or assault by another person (Guedes et al., 2010). In adolescents and young adults, assaults and traffic accidents are the most common etiologic factors (Glendor, 2009) .

The management of traumatic dental injuries to the primary teeth differs from that used for permanent dentition. Primary dentition plays a very significant role in speech development, esthetics and function of the children(Ravikumar, Jeevanandan and Subramanian, 2017). There is a close relationship between the apex of the root of the injured primary tooth and the underlying permanent tooth germ. Tooth malformation, impacted teeth and eruption disturbances in the developing permanent dentition are some of the consequences that can occur following severe injuries to primary teeth and/or alveolar bone because of these potential sequela, treatment selection should be such that it doesn't cause any type of damage to the permanent successor teeth. Damage to the primary teeth has an impact on the succedaneous teeth.Treatment for traumatic dental injuries are complex and meticulous follow up examinations are required. Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J et al.,

2018; Menon et al., 2018; Prabakar et al., 2018; Rajeshkumar et al., 2018, 2019; Vishnu Prasad et al., 2018; Wahab et al., 2018; Dua et al., 2019; Duraisamy et al., 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu et al., 2019; Mehta et al., 2019; Rajendran et al., 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma et al., 2019; Varghese, Ramesh and Veeraiyan, 2019; V. Panchal, Jeevanandan and Subramanian, 2019; Gomathi et al., 2020; Samuel, Acharya and Rao, 2020)
Thus the aim of the study was to analyse the prevalence of traumatic dental injuries in primary teeth among children in the age group of 1-6 years and patients with oral habits like mouth breathing habit and duration they took to report for the treatment..

MATERIALS AND METHODS

A single centre retrospective study was done in an institutional setting. The ethical approval was received from the institutional ethical committee. The study involved selected patients data who had traumatic dental injury between the age group of 1-6 years. The necessary approvals in gaining the datas were obtained from the institutional ethical committee(SDC/SIHEC/2020/DIASDATA/0619-0320) The number of people involved in the study includes 3 i.e., Guide, Reviewer and Researcher.

Selection of Subjects:

All patients who had experienced traumatic dental injury between the age group 1-6 years from the time period of june 2019 to april 2020 were selected for the study (N=2263). All available data were taken into consideration and there was no sorting process.

Data collection:

The details of 2263 patients were retrieved from the institution's case sheet records and were reviewed, Data involving patients age, gender, medical condition, oral habits, duration taken to report for treatment were retrieved from patients records. Cross verification of the data was done with the help of photographs and radiographs and all the data was manually verified, tabulated and sorted.

Inclusion criteria

All patients who had experienced traumatic dental injury between the age group of 1-6 years were included in the study.

Exclusion criteria

Patients' records that were incomplete were removed from the study. Repetitive entries were also removed. Patients who had systemic illness, dentoalveolar fractures, Loss of tooth due to caries were also excluded from the study.

Statistical analysis

The tabulation of data was analysed using SPSS software (IBM SPSS Statistics version 23.0) The method of statistical analysis that was used in this study was Chi square test to compare two proportions. The analysis was done for age, gender, mouth breathing habit and duration taken to report for treatment in this study.

RESULTS AND DISCUSSION:

From the above study we can observe that avulsion is the most prevalent traumatic dental injury seen in females(25%) when compared to males(8.33%) and fracture involving enamel,dentin and pulp and crown en masse was the prevalent traumatic dental injury seen in males(16.67%) when compared to females(8.33%) and the results were statistically not significant ($p>0.05$)(Figure 1). A Cross sectional study conducted by ravikumar et al report that avulsion is more common in primary teeth due to the resilient alveolar bone, and the prevalence has been reported to be 5.8%(Ravikumar, Jeevanandan and Subramanian, 2017). A similar study conducted by Garcia et al shows that concussion was the most common traumatic dental injury seen among the children of 1-7 years and males were more prevalent to dental injuries and it also says that emergency pediatric patients with trauma (38.7%) reported to the clinic on the same day and 37.8% of them 1-7 days later(Garcia-Godoy, Garcia-Godoy and Garcia-Godoy, 1987).

It is observed from our study that children who have the habits of mouth breathing are more prevalent to have avulsion(33.33%) when compared with other forms of injury and the results obtained were statistically not significant($p>0.05$)(Figure 2). A study done by Garcia et al showed that traumatic fractures in pre school aged children were commonly due to proclination of anterior teeth(Garcia-Godoy, Sánchez and Sánchez, 1982). Bhayya and Shyagali assessed the prevalence of traumatic injuries of primary dentition in Gulbarga city, India and reported that crown fracture was the most prevalent type of fracture and the primary reason was due to fall.(Bhayya and Shyagali, 2013)

It is found in our study that the majority of the patients with avulsion had reported for treatment within 1 hr(8.33%), 1 day(16.67%) and 1 year(8.33%) and patients with fracture involving enamel had reported within 1 day(8.33%) and patients with fracture involving enamel, dentin and pulp had reported within 2 days(8.33%), 3 days(8.33%) and 14 days(8.33%) and patients with non vital tooth had reported within 7 days(8.33%) and patients with crown en masse had reported within 1 day(8.33%), 2 days(8.33%) and 14 days(8.33%) after the experience of traumatic dental injury and the results were statistically not significant ($P>0.05$)(Figure 3).

Another study conducted by Ferguson et al and Garcia et al shows that dislocation and subluxation injuries were more common among the age of 1-6 years (Ferguson and Ripa, 1979).Previously our team had conducted numerous clinical trials(Somasundaram, 2015; Govindaraju, Jeevanandan and E. M. G. Subramanian, 2017b; Jeevanandan and Govindaraju, 2018) and lab animal studies (Christabel and Gurunathan, 2015; Packiri, Gurunathan and Selvarasu, 2017; Veerale Panchal, Jeevanandan and Subramanian, 2019) and in vitro studies(Govindaraju and Gurunathan, 2017; Govindaraju, Jeevanandan and E. Subramanian, 2017; Ramakrishnan and Shukri, 2018; Subramanyam et al., 2018; Lakshmanan et al., 2020) over the past 5 years. Now we are focussing on epidemiological studies. The idea of this study stemmed from the current interest in our community.Thus Proper diagnosis is essential to achieve an effective treatment plan, Prior to any treatment, one must find time to evaluate the injury thoroughly by careful clinical and radiographic investigations. Clinically, sensibility tests should be conducted on all teeth involved as well as opposing teeth. Cold testing is recommended over electric pulp testing in young individuals (Fuss et al., 1986). Radiographs such as CBCT can be used to observe a three dimensional view of the injury when it involves association with alveolar fractures. One occlusal and two periapical radiographs with lateral anulations can be taken for crown fractures. The time period of the avulsed tooth out of its socket is the most critical factor for its survival in the oral environment. If reimplantation is done within 30 minutes, or alternatively kept in a physiological solution of specialized media or milk for a few hours, it has a fairly good prognosis, this is done in order to preserve the vitality of the pdl fibres and a physiologic splint is placed for 2 weeks (Blomlöf et al., 1980). Teeth with open apex have a chance of revascularization whereas teeth with closed apex need to be root canal treated after 2 weeks before which can cause more damage to PDL fibres.Pulpectomy procedure is performed in primary teeth to avoid extraction and to maintain its form and function(Govindaraju, Jeevanandan and E. M. G. Subramanian, 2017a), The Kedo-S paediatric rotary file system will help the dentist in performing the pulpectomy procedure faster when compared to conventional hand files. (Govindaraju, Jeevanandan and E. M. G. Subramanian, 2017a; Jeevanandan, 2017; Jeevanandan and Govindaraju, 2018)In case of incisal fractures, restoration is the treatment of choice.
Dental neglect is also one of the primary reasons for the loss of tooth after a traumatic injury(Gurunathan and Shanmugaavel, 2016) therefore, preventive education programs regarding traumatic dental injuries in primary teeth should be implemented to parents and schoolteachers. This target population would be extremely useful in detecting most cases of traumatic injuries and referring these children to the dentist. Traumatic dental injuries present as a challenge for the patient as well as the dentist, Careful monitoring of these cases are very significant to preserve the tooth which can change the mind from a hopeless situation to satisfactory outcome for the patients.Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh et al., 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai et al., 2019; Sridharan et al., 2019; Vijayashree Priyadharsini, 2019; Mathew et al., 2020)

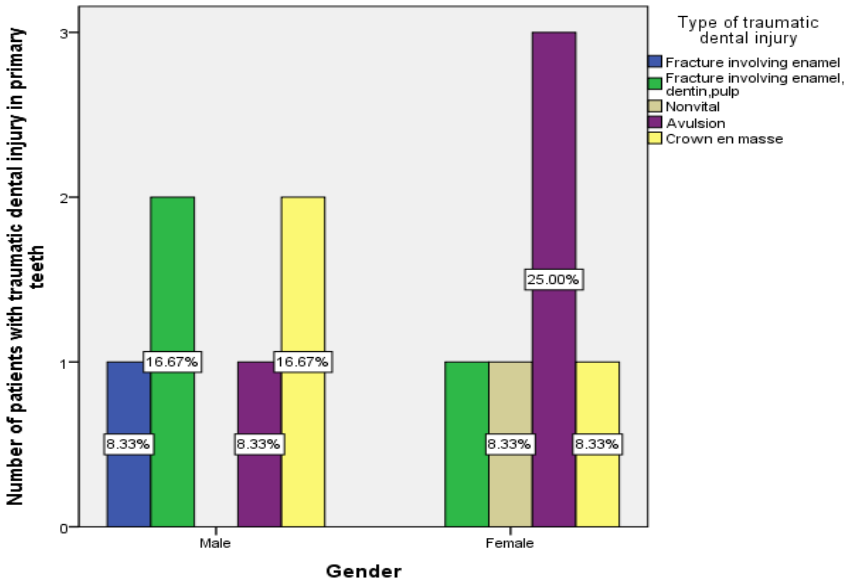

Fig.1: Bar graph represents the association between gender and various forms of traumatic dental injury in primary teeth. X-axis denotes gender and Y axis denotes number of patients with traumatic dental injury in primary teeth. Higher Prevalence of avulsion was seen among females(25%; purple) and injury involving enamel,dentin and pulp and crown en masse among males(16.67%; green;yellow) compared to other forms, which was not statistically significant. (Chi square test, p-value: 0.453 (p>0.05), not statistically significant).

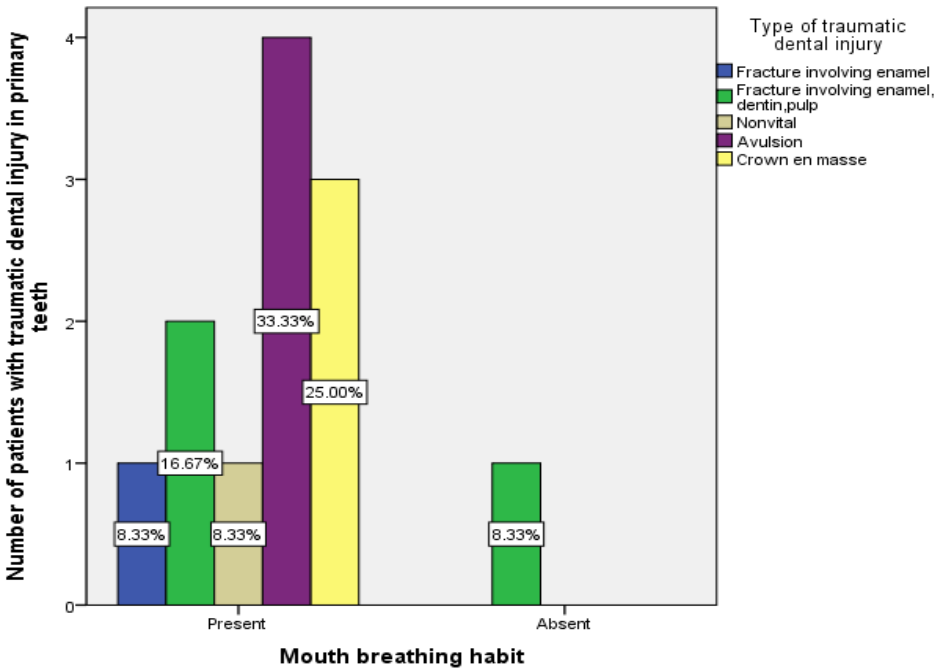

Fig.2: Bar graph represents the association between mouth breathing habit and traumatic dental injury in primary teeth. X-axis represents mouth breathing habit and Y axis represents number of patients with traumatic dental injury in primary teeth. Higher prevalence of avulsion was seen in children with mouth breathing habit (33.33%; purple) compared to fracture involving enamel dentin pulp in children without mouth breathing habit and results obtained were not statistically significant. (Chi square test, p-value: 0.453 (p>0.05), not statistically significant).

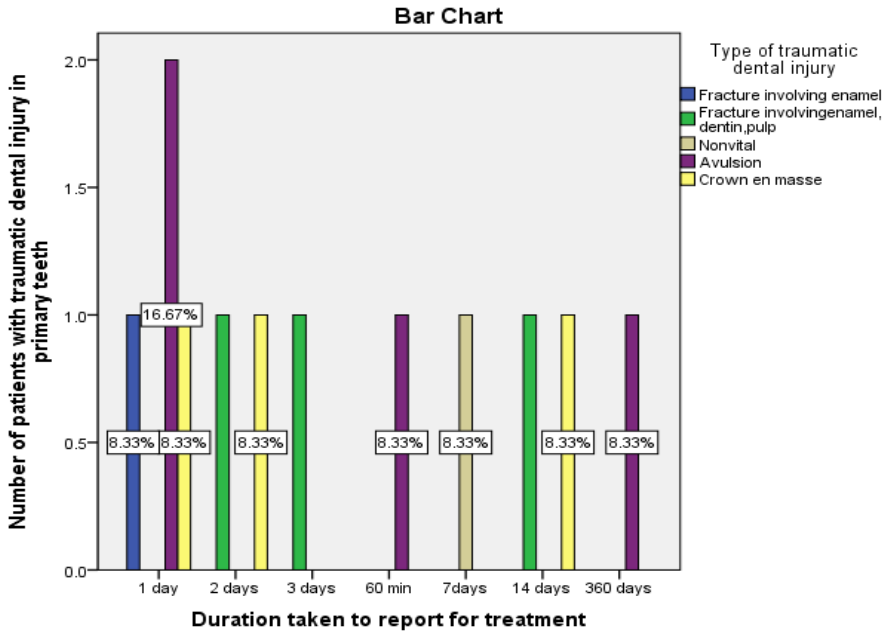

Fig.3: Bar graph represents the association between duration taken to report for treatment and traumatic dental injury in primary teeth. X-axis represents duration taken to report for treatment and Y axis represents the number of patients with traumatic dental injury in primary teeth. Higher prevalence was seen among patients with avulsion who reported for treatment within 1day(16.67%; purple) compared to other forms which are not statistically significant. (Chi square test, p-value: 0.406 (P>0.05), not statistically significant).

CONCLUSION:

Within the limits of the study of prevalence of traumatic dental injuries, Children aged 5 and 6 years were more prevalent to have traumatic dental injuries in which females were more affected, avulsion was the common traumatic dental injury seen and subjects took minimum one day to report for treatment. Subjects who had avulsion also had oral habits of mouth breathing. Thus it is important for the parents to make sure the child gets necessary treatment in a short span of time to prevent loss of the injured tooth. Dentists should teach their adult patients about the importance of preserving the tooth after an injury like avulsion and also the significance of injury underlying permanent tooth and report to the clinic immediately for the treatment in case the child undergoes a traumatic dental injury.

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CONFLICT OF INTEREST

The authors would like to declare that there is no conflict of interests.

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