EXPERIENCE OF DENTAL UNDERGRADUATE STUDENTS ON TREATING CHILDREN WITH TRAUMATIC DENTAL INJURIES - A QUESTIONNAIRE SURVEY

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ABSTRACT

Traumatic dental injury (TDI) in children and adolescents has become one of the most serious dental public health problems. Despite such a high prevalence of dental trauma, very less attention has been paid to TDI, its etiology, and prevention.

Aim: This study was to determine the experience of dental undergraduates on treating traumatic dental injuries among children.

Materials and methods: The sample consisted of 100 students in a private dental college in Chennai. Students who have had a past experience of handling a patient with traumatic dental injuries were chosen for the study. Questions were provided related to traumatic dental injuries and the data collected was tabulated and subjected for statistical analysis.

Results: The results showed that the majority of dental undergraduate students answered 65% were diagnosed with crown root fracture. Permanent maxillary central incisors were most commonly injured teeth and mandible was mostly affected bone during traumatic injuries. Discussion: Comparison of the responses based on gender of the respondent and the year of study did not show any statistical significant differences. Awareness about traumatic dental injuries have to be emphasized to dental students for a better knowledge and practice to improvise their clinical expertise.

Key words: Dental trauma, Crown Fracture, Central incisor, Mandible, Dental undergraduates.

I. INTRODUCTION

Trauma to anterior teeth is unacceptable and prevention of this is of high necessity in the personality development of the child. The main etiology being accidents like falls during sports. They are associated with various factors like biological, socio-economic, psychological and behavioural factors. The predisposing dental risk factors include increased incisal overjet, open bite, protrusion and lip incompetence (Hovland and Gutmann, 1976; Dumsha and Hovland, 1982). During school, children actively indulge in outdoor play, especially contact games. Careless activities increase the possibility of injuries. Though these activities are markers of growth and development of the child, loss of balance and impaired movements are the result of traumatic injuries (Navabazam and Farahani, 2010).
Risks and severity to dental trauma vary according to the age, sex, and location of the tooth in the oral cavity. A review of literature has shown that a higher degree of prevalence among anterior dental trauma exists compared to posterior teeth (Caldas, de Franca Caldas and Burgos, 2001). Preschool children are more prone due to their inadequate stability, unconditioned reflexes and indefinite movements. Traumatic injuries in primary teeth result mainly from indoor injuries, such as falling from baby carriages, falling from stairs, or falling against hard objects (Navabazam and Farahani, 2010). Dental trauma is a significant problem in young people and the incidence of trauma will exceed that of dental caries and periodontal disease (Cortes, Marcenes and Sheiham, 2002). Previously our team has a rich experience in working on various research projects across multiple disciplines (Neelakantan et al., 2015; Ramamoorthi, Niveditha and Divyanand, 2015; Abdul Wahabet et al., 2017; Eapen, Baig and Avinash, 2017; Manivannan et al., 2017; Patilet et al., 2017; Ezhilarasan, Sokal and Najimi, 2018; Jeewanand and Govindaraju, 2018; Ravindiran and Praveenkumar, 2018; Wahabet et al., 2018; Mallisureshabuet et al., 2019; Mehta et al., 2019; Rajeshkumaret et al., 2019; Samuel, Acharya and Rao, 2020; Sathish and Karthick, 2020).

Recent studies have shown that there is a decrease in the incidence of dental care owing to the development and implementation of various programmes in the prevalence of dental caries. However, TDI are on the rise and are the 3rd largest cause for the mortality of teeth but the treatment of TDIs tends to be neglected. Although the majority of the studies on TDI are on permanent teeth in adolescents were conducted in Europe and Americas but there are few studies from Asia and Africa (Guedes et al., 2010).

II. MATERIALS AND METHODS

Study design
The current study was a cross-sectional questionnaire study planned in a hospital based university setting.

Ethical approval
Ethical approval for the study was provided by the Institutional Ethical Research Committee.

Study population
The study population consisted of 100 undergraduate students attending the clinics of a private dental institute. Students who had past experience in treating a pediatric patient with a traumatic dental injury were recruited for the study. Students who provided consent participated in the study and others were excluded.

Questionnaire
A structured closed-ended questionnaire with a total of 10 questions related to their experience in treating traumatic dental injuries was used to assess the knowledge among undergraduate students. Questionnaire validation was based on content validity and logical reasoning.

Statistical analysis
The data collected was entered into an MS Excel sheet and subjected to statistical analysis using SPSS version 20. Chi square test was done. The level of significance was set at p<0.05.

III. RESULTS & DISCUSSION

About 100 responses were obtained within a period of 1 week. Among the respondents 44% were males and 56% were females. About 35% of respondents were interns, 35% were final year undergraduate students and 30% were third year undergraduate students.

Traumatic dental injuries noticed by the undergraduate dental students was more prevalent among four to five year old children (Figure 1). The most common type of traumatic dental injury involving hard tissues that was frequently noticed was uncomplicated crown fracture (65%), while crown-root fracture was the least noticed (5%) (Table 1). About 50% of students experienced that maxillary central incisors were more prone to injury. About 20% noticed dental injuries commonly in maxillary lateral incisors, another 20% in mandibular central incisors, while only 10% have noticed in mandibular lateral incisors (Figure 2). The discolouration of the traumatised teeth was mainly due to degeneration of pulp as said by 55% of the students, while 25% considered it to be due to extravasation of RBC from blood vessel and 20% perceived that it was due to resorption of dentin from trauma (Figure 3). Among the traumatic dental injuries involving supporting structures, about 40% of students have noticed fracture of alveolar bone while the least noticed was contusion (15%)(Table 2). About 90%
of reported that pulp vitality tests were not done immediately after trauma. Over 75% of students said that taking a radiograph of the traumatised tooth was important to determine root fracture, assess the stage of root development and as a base for future comparisons. About 80% of students considered that that yellowish teeth discolouration was mainly due to pulp chamber calcification, while 20% considered it was due to pulp hyperaemia, pulp necrosis and internal resorption. Majority of respondents had seen children with mandibular fractures (50%) while only 10% have noticed zygomatic fractures (Table 3). About 90% of students considered fracture of permanent maxillary central incisors was common in children with class II malocclusion.

Comparison of the responses based on gender of the respondent and the year of study did not show any statistical significant differences. (p> 0.05)

Figure 1: Pie chart representing the frequency of traumatic dental injury noticed among different age groups of children. 85% of respondents noticed traumatic injuries in children between 4 to 5 years of age (red).

<table>
<thead>
<tr>
<th>Traumatic dental injury (Hard tissue)</th>
<th>Percentage of respondents noticed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crown fracture</td>
<td>65%</td>
</tr>
<tr>
<td>Root fracture</td>
<td>10%</td>
</tr>
<tr>
<td>Crown-root fracture</td>
<td>5%</td>
</tr>
<tr>
<td>All the above</td>
<td>20%</td>
</tr>
</tbody>
</table>

Table 1: Table showing percentage of respondents noticing the different types of traumatic dental injuries involving hard tissues.
Figure 2: Bar chart representing the common teeth that were noticed with traumatic dental injuries. Maxillary central incisor was the most commonly diagnosed teeth with traumatic dental injury.

Figure 3: Pie chart showing the common reasons for discoloration of the traumatised teeth as perceived by the dental students. Majority considered it was due to the degeneration of pulp (Pink-55%).

<table>
<thead>
<tr>
<th>Traumatic dental injury (Supporting structures)</th>
<th>Percentage of respondents noticed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrusion</td>
<td>20%</td>
</tr>
<tr>
<td>Contusion</td>
<td>15%</td>
</tr>
<tr>
<td>Fracture of alveolar bone</td>
<td>40%</td>
</tr>
</tbody>
</table>
Dental trauma in addition to causing pain and loss of function has the potential for periapical sequelae, which can adversely affect the development of the permanent teeth as well as the developing occlusion (Glendor, 2009). Epidemiological data showed a wide variation in the prevalence of dental injuries in children. Dental injuries to the deciduous teeth can result in problems to the underlying permanent teeth, such as hypoplasia, discoloration, and delay in eruption time, and tooth malformation (Díaz et al., 2010). The consequence of dental trauma includes pain, infection, alteration in physical appearance, speech defects, and emotional impacts; thus, affecting the child's quality of life.

Injuries during childhood have been considered a global public health problem and injuries have become the primary cause of death and disability of human beings (Cortes, Marcenes and Sheiham, 2002; Guedeset et al., 2010). A wide range of variation has been found on studying the prevalence of traumatic dental injuries (TDIs) to anterior teeth among schoolchildren in different parts of the world. The prevalence of TDI to anterior teeth among adolescents in Asia and Africa ranges from 4% to 35% and 15% to 21%, respectively. In America and Europe, the prevalence varied from 15% to 23% and 23% to 35%, respectively (Ravishankaret al., 2010). These figures represent the burden of TDI on the community, affecting the different population of various age groups. Hence, traumatic dental injuries to anterior teeth have become a significant public health problem, by having a considerable effect on a child’s day to day life, in addition to its high prevalence (Ravishankaret al., 2010; Kumar et al., 2011). Most of these injuries cause an adverse impact on physical, psychological, educational, social and economic aspects of the affected individual and their family. Moreover, researchers have found an association between dental problems and academic achievement and learning in affected children. It becomes the role of health professionals to elucidate the causes and risk factors of TDI, so as to prevent its occurrence.

To allow or implement the application of adequate preventive actions for traumatic injuries, the knowledge of its risk factors is of utmost importance. Prevention of traumatic dental injuries will be possible only if it is based on reliable data relating to its prevalence, causes and risk factors. However, it is unfortunate that people are not aware of the risk factors and the ways to avoid traumatic dental injuries. Also, some dentists and health professionals do not give much importance to the prevention of dental trauma and are more concerned about the treatment aspects (Altunet al., 2009).

In most of the previous studies, increased over jet, incompetent lip coverage and maxillary incisor protrusion have been reported to have an association with the occurrence of traumatic dental injuries. There are complex interactions of these oral risk factors with the environmental factors and individual behaviors. All these risk factors need to be studied in order to implement appropriate preventive actions.
factors together highlight the complexity of the etiology of dental trauma (Cavalcanti et al., 2009; David, Astrom and Wang, 2009). 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). We hope this study adds to this rich legacy.

Traumatic dental injury is a consequence of several factors that will accumulate throughout life if not accurately treated. This study was taken by about 100 dental students in Saveetha dental college, Chennai. The students were third year, final year and the interns. In most of the previous studies, the prevalence was found to be higher in boys than girls. The reason for more traumas in boys was their participation in leisure activities or sports of a more aggressive nature than girls (Rai and Munshi, 1998; Adekoya-Sofowora et al., 2009).

The following measures should be taken to reduce the traumatic dental injuries among children (Slayton and Palmer, 2019)

1. The use of intraoral and extraoral devices which protects the face and teeth from trauma
2. Elimination or reduction of predisposing factors in the form of orthodontic treatment
3. Educational programs whereby the children and their parents are given information regarding the preventive and treatment aspects of this commonly occurring condition
4. Health promotion policies should aim to create an appropriate and safe environment.

In addition, the fact that pubertal growth rates are delayed in boys, so girls are more mature in nature at an earlier age than boys could be a factor. However, in the present study there was no statistically significant difference found in TDI among girls and boys; this finding was similar to other previous studies which might be due to societal changes, including an increase in the participation of girls in sports, which can lead to trauma. Age is another well-established risk factor, and although TDI has been reported in all age groups, it is more prevalent in school children and teenagers (Nowjack-Raymer and Gift, 1996; Dua and Sharma, 2012).

It is highly recommended to plan a program targeting parents, children, and school staff. In addition, holding proper educational programs to enhance the level of general knowledge about prevention and managing these injuries seems necessary. In these programs, the importance of proper treatment of traumatized teeth, be the primary or permanent, should be stressed to prevent their biologic and psychologic consequences (Gurunathan, Murugan and Somasundaram, 2016).

IV. CONCLUSION

Within the limitations of the present study, the most common type of traumatic dental injury involving hard tissues was uncomplicated crown fracture, involving supporting structures was fracture of alveolar bone and involving bones was mandible. Permanent maxillary central incisors was common in children with class II malocclusion. There were no significant differences with the gender and year of study of the students.

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CONFLICTS OF INTEREST

The authors of the study declare that there were no conflicts of interest.

REFERENCES


