

Anterior Dental Injuries in 8 to 12-Year-Old School Children of Yamuna Nagar, Northern India: A District Wide Oral Health Survey

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Abstract

Background: Traumatic dental injury (TDI) is a public dental health problem because of its frequency, occurrence at young age and may have debilitating effects, if left untreated. The aim of the study was to investigate the prevalence of dental trauma in anterior teeth among school children of Yamuna Nagar (Haryana), Northern India. **Materials and Methods:** A sample of 11,897 school children in the age group of 8-12 years from 36 urban/rural schools was examined for TDI using Ellis and Davey classification. Children with TDI were interviewed using a structured questionnaire and presented with validated Motivational Video to educate them about dental trauma, sequelae of unmet treatment and to motivate them to undergo treatment. The subjects with trauma were re-evaluated after 6 months to assess the percentage of subjects who have undergone treatment after motivation. **Result and conclusion:** The overall prevalence of children afflicted with TDI was 6.33%. Statistically significant difference ($p \leq 0.001$) was found between the percentage of boys (7.29%) and girls (4.8%) experiencing TDI. Maxillary incisors (94.3%) were most commonly injured teeth. Fall in the playground (37.70%) being the major cause, on re-evaluation, only 9.26% of the study population got their traumatized tooth treated. TDI is an existing dental problem. Motivating children at schools was found to be ineffective. There is need to educate the parents and teachers to take appropriate preventive measures.

Keywords: Traumatic dental injury (TDI), prevalence, tooth fracture, Dental Health Education.

Introduction

Nowadays, TDI is attributed as a public dental health problem due to a spectrum of factors like its high frequency and early age of occurrence, irreversible nature and complicated treatment. Trauma to the oral region occurs frequently and contributes to about 5 percent of all injuries for which people seek treatment in dental clinics and hospitals. TDIs generally occur at a young age during which growth and development takes place. In preschool children it accounts for as much as 18 percent of all injuries. Treating a TDI can often be complicated and expensive, frequently involving participation of specialists of several disciplines. In contrast to many other traumatic injuries being treated on an outpatient basis, a TDI is frequently irreversible and thus raising a possibility that treatment procedures are likely to continue for the rest of the patient's life.

Moreover, it has been observed that there is perhaps no single

disturbance that has greater psychological or emotional impact on both the parents and children than the loss or fracture to the anterior teeth of the child. An untreated and unsightly fracture of an anterior tooth can adversely affect the self esteem of a child, his progress in school, and can have deleterious impact on their daily living. Unfortunately, our ability to prevent injuries to oral structure is limited. Living and growing carry a high risk of trauma. But on the brighter side, preventive measures that can reduce the prevalence of traumatic episodes can be planned out by carrying out cross-sectional studies. Periodic surveys are carried out to obtain health-related data from a random sample of the population. Data collected on demographic and personal characteristics, the prevalence of acute and chronic diseases, perceived health-care needs and the utilization of health care services form the basis of cross sectional surveys.

Most studies related to the epidemiology of traumatic dental injuries do not provide enough details of the causes of TDI

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to prioritize the factors that should be addressed, despite being a major public health problem worldwide. The present study set out to give more detailed vision into the factors and content associated with TDI in India. There is no information on prevalence of dental trauma in Yamuna Nagar district of Haryana. Therefore, the present study was performed with an aim to determine the prevalence of treated and untreated cases of anterior tooth trauma among 8-12 years old school children in Yamuna Nagar district of Haryana, Northern India and to find if any predilection exists for either of sex along with impact of Motivational interview (video+verbal) in mobilizing the patient for the treatment[1-5].

Material and Methods

District Yamuna Nagar is located in the Haryana state and is the industrial locus of Northern India. Over the past 30 years, it has expanded geographically as well as culturally. This district because of its economic growth attracts people from all over India; hence in a way represents “Mini India”. Administratively, it is divided into six developmental blocks which comprise of Urban and rural population.

A district wide cross-sectional survey was conducted among 8-12 years old school going children from selected schools of all the six blocks so as to include schools from all geographical directions. Further to ensure the participation of children from all the socioeconomic groups, the schools from each block were divided into three categories as low, middle and High as per their school fees. Two schools in each category were selected randomly from each block. Thus, the present study represents the population that includes children enrolled from selected 36 schools of District Yamuna Nagar, Haryana.

Prior to the commencement of the survey, ethical approval and official permission were sought from the Institutional Ethical Committee and District Education Officer Yamuna Nagar respectively. An information letter/informed consent regarding the objective of the survey & its importance, oral examination procedure, date and time of examination was sent to all the parents/guardians of children of the selected schools through their class teachers. This form was collected from the respective class teachers on the day of examination.

The examination was carried out by a single trained examiner in the school premises in natural day light using sterilized diagnostic instrument kits. Full mouth oral examination was done for all the children and oral hygiene instructions were given to them. The traumatic injuries to the teeth were recorded using (1960) classification. However, Ellis and Davey's Type VI fracture was not included in the survey as dental radiographs were not available in the in-school field conditions. Children were then interviewed for history of injury and information concerning the cause of trauma, number of injured teeth, type of the teeth involved were

recorded through trauma assessment form using a structured questionnaire. After oral examination, children were shown a validated Motivational Video so as to educate them about dental trauma, sequelae of unmet treatment, emergency first-aid measures, all the treatment options available and to motivate the patients with trauma to get their treatment done. In addition, to evaluate the impact of Motivational interview, all the students with trauma were re-evaluated after 6 months so as to ensure that how many patients got the treatment done [6-11].

The statistical analysis was done using SPSS (Statistical package for Social Sciences) version 17.0. The Chi-square test was carried to compare qualitative data and determine statistical significance which was predetermined at a probability value of 0.05 or less.

Results

Out of 11897 students examined during the survey, 7196 (60.48%) were males and 4701 (39.52%) were females. Mean prevalence of traumatic dental injury was found to be 6.33% (754/11897). Among the affected study population, 7.29% were males as compared 4.8% of females (p-value= < 0.001*).

Prevalence rates were found to be 11.1% at age 8, 12.3% at age of 9. Treated cases of trauma were only found to be 1.2%. Maxillary teeth (94.3%) were affected more by dental trauma than mandibular teeth (5.18%) and right maxillary central incisor (52.50%) was most commonly involved by dental trauma. A high prevalence was seen in children with high socioeconomic status (**Table 1**).

Table 1. Prevalence and Male: Female Ratio for Dental Injuries to permanent Anterior Teeth in School Children (n=11897) aged 8-12 years, Yamuna Nagar, 2013

Gender	Dental Injury		Total n (%)	Boys: Girls Ratio	p-value
	Yes, n (%)	No, n (%)			
Boys	525 (7.29)	6671 (92.70)	7196 (60.48)	2.2:1	<0.001**
Girls	229 (4.8)	4472 (95.12)	4701(39.51)		
Total	754 (6.33)	11143 (93.67)	11897(100%)		
*Chi-square test					

58.92% study population didn't visit any dentist/doctor when they had experienced dental trauma. Rather, a high prevalence of self medication was observed among the traumatized children.

66.84% study population felt that their smile was comprised due to lack of treatment at the time of dental trauma.

Leave the tooth as such on the ground (34.5%) was the most

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common reply by the study population when asked what did they do to a broken tooth (**Table 2**).

Table 2. Nature of Injured Tooth in Children.

Nature of Trauma	No. of Injured Teeth		Boys		Girls		p-value
	n	%	n	%	n	%	
Treated	9	0.9	5	0.7	4	1.4	0.04*
Class-1	516	54.3	355	53.1	161	57	
Class-2	305	32.1	213	22.4	92	32.6	
Class-3	98	10.3	73	10.9	25	0.3	
Class-4	19	2	19	2.8	0	0	
Class-8	3	0.3	3	0.4	0	0	
Total	950	100	668	100	282	100	

On re-evaluation after six months regarding the impact of motivational (video + verbal) interview, it was found that only 69 (9.26%) of study population got their treatment done for traumatized tooth after watching motivational video whereas 676 (90.74%) still remained untreated.

Discussion

The analysis of available literature showed that prevalence of TDI varies significantly across the various populations, which may be a result of variability of criteria according to which dental trauma was being measured and a series of factors i.e. age range studied, behavioral & cultural diversity between countries and within countries, rural/urban population, trauma classifications employed, type of dentition, geographical and life style differences in the study population and the access to health services for evaluation and treatment purposes, all of which, individually or combined, makes data comparison a difficult task.

The view that boys sustain more injuries than girls could be challenged. As, nowadays, there may be more girls getting traumatic injuries as compared to boys because of increased participation of girls in sports/activities formerly only practiced by boys. Also, a previous Brazilian study had already indicated an increasing trend of dental trauma among girls.

While Analyzing dental trauma cases in relation to age, we found that the distribution of cases increased with age and a statistically highly significant difference was observed ($p\text{-value} < 0.001$). This was also demonstrated in a number of national and international studies. The study showed that the peak incidence of injury was at 11-12 years of age. The factor that the prevalence of dental injury increased with age did not mean that the oldest were the most vulnerable. The characteristics of traumatic injuries mean that the measurement of this type of dental injury is cumulative [12-15].

We used Ellis and Davey's (1960), classification for our

study, although this classification is old, but is a simplified classification. As the sample size of the present study was large and we did not evaluate injuries to the alveolar socket and fractures of the jaws or laceration of gingival or oral mucosa, we preferred to use simple classification instead of Andreassen's classification because of its ease of use, numeric notation and accuracy in assessing anterior coronal fractures. Ellis Class 1; Simple fracture of crown (54.84%) were the most common type of dental trauma encountered in the study population. This was in accordance with earlier studies.

The Right maxillary central incisors (52.5%) were more commonly involved by dental trauma. 37.70% of the study population had dental trauma by fall in playground. In this study, we asked the participants to specify the cause of the dental injury, the percentage of fall was recorded in three different forms; fall in playground, fall from stairs, fall from terrace without fencing. The second most common cause was of Unknown reason i.e. no obvious reason. As the study was retrospective in nature and several children did not remember the origin of the dental trauma.

One of the aims of epidemiological studies should also be to help the children to get educated & motivated for the appropriate treatment. As Video based learning is the medium of learning for today's generation. This is the only study so far that included both visual as well as verbal motivational approach. Despite of free Consultation and treatment back up, the study had shown a shocking revelation that dental awareness was very low as evident in the number of children (9.26%) who got the treatment done whereas 90.74% still remained untreated when evaluated after 6 months. There was therefore high unmet treatment need.

The attitude of parents regarding treatment of injured tooth was not impressive. This is an indicator that in our society patients and parents do not give importance to traumatic dental injuries and have a tendency of consulting dental hospitals after the time had elapsed or wait until they had acute symptoms of inflammation or aesthetic concerns. The parents/guardians had not tried to find therapeutic opportunities if their dependants suffered crown fractures.

Conclusion

Educational programs containing information regarding the preventive & treatment aspects of traumatic dental injuries and importance of immediate attendance for dental treatment should be encouraged to the children, their parents and school teachers. The knowledge of dental practitioners should be improved through continuing dental education in order to minimize effects of traumatic dental injuries.

Conflict of Interest

There are no conflicts of interest.

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