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PREVALENCE OF TRAUMATIC INJURIES TO THE PERMANENT INCISORS OF SCHOOL CHILDREN AGED 9-13 YEARS IN, MUGAPPAIR, CHENNAI.

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ABSTRACT

Aim: To assess the prevalence and factors associated with permanent anterior teeth traumatic injuries in 9-13 year old school children of Mugappair, Chennai. **Materials and Methods :** Children aged 9 to 13 years from both the public and private schools in, Mugappair, Chennai formed the study population. Oral examination was done and traumatic injuries were recorded according to Holland's modification of Ellis and Davey classification. A total of 1515 children, of which 855 (56.44%) were boys and 660 (43.56%) were girls were included for the study.

Results: The prevalence of children with anterior teeth traumatic injuries was found to be 19.41%. Age and gender were significantly associated with dental trauma. Male children were more affected than female children and the prevalence increased with age in the ratio of 2:1. Enamel fracture (64.97%) was the most common type of injury followed by enamel-dentine fracture(22.79%). The cause of all type of fractures was mainly due to fall during playing followed by bicycling.6.46% of children did not report the cause of trauma. Traffic accidents and violent impacts which often cause dental trauma were also less uncommon.

Conclusion: The present study shows that there is a high prevalence of dental trauma among school going children of Chennai. Education regarding the dental injuries and its prevention through health promotion programs may play a major role in reducing the prevalence of dental injury and avoiding the financial costs of treatment, especially in developing countries.

Keyword: School Children, Dental Trauma, Permanent Anterior teeth, Age Group.

INTRODUCTION

Traumatic dental injuries are a serious public health problem among children and this makes it an area of interest to dental educators, clinicians, and coordinators of emergency health care services. Epidemiological data provides a basis for evaluation of the concepts of effective treatment, resource allocation and planning within any health environment.[1] Dental trauma is an important issue, since fracture of one or more teeth, especially the anterior, may result in pain, loss of function, poor aesthetics and psychological trauma.[2] Dental injuries constitute a true dental emergency which requires immediate assessment and management. There are few reports available on the epidemiology of injuries of the teeth of children when compared to epidemiological data on dental caries and periodontal diseases.[3] Over the last two

decades there has been a dramatic decline in caries prevalence in the developed countries. As a consequence of this, the problem of traumatized teeth has gained relative importance.[4] The prevalence of traumatic dental injuries among school children in different parts of the world varies from 2.6% to 43.8 %.[5,6] .With the advancement in civilization, children are more exposed to situations where trauma has become a mandatory consequence. During school age, children are actively involved in outdoor play which results in injuries. Though these activities are markers of growth and development of the child, loss of balance and impaired movement may result in traumatic injuries. In addition to this, participation of children in sports and increased incidence of road traffic accidents have led to occurrence of dental injuries. The face and teeth being the most exposed parts of the body have a higher tendency to fracture. Oral injury is the fourth most common type of bodily injuries in 7–30 years old population group .[7]Trauma to children's teeth especially anterior permanent teeth occurs quite frequently than adults and the frequency of traumatized teeth increases with the increase of age till the age of 12 years. [8, 9] It appears that gender, age and type of occlusion are important predisposing factors for the occurence of dental trauma.[10]

The aims and objectives of this study are:

1. To estimate the prevalence and severity of traumatic dental injuries to the permanent anterior teeth in children
2. To identify the age and gender at risk to dental trauma.
3. To predict the most common factor for traumatic injuries.
4. To assess the most common anterior teeth affected by trauma.

MATERIALS AND METHODS

A total of 1515 children were selected from both public and private schools in Mugappair ,Chennai .An informed consent letter was sent to the parents of the children aged between 9 to 13 years explaining , the importance of the study, and asking for permission for their child to participate in the proposed study. Children who agreed to participate in the study were examined at the schools during class hours, in a predetermined timetable, as arranged with the school principals. The instruments and material needed were packed and sterilized in sufficient quantities for examining the children. (WHO, Oral Health Surveys - Basic Methods, 1997).[11] Mouth mirrors and explorers were used to examine participants under natural light within school premises. The examination of the tooth was done in an orderly manner from one quadrant to other. The dental examination included only upper and lower incisors. The presence of both treated and untreated injured teeth was taken into consideration so as to calculate the prevalence of dental trauma .They included the presence of fractures, discoloration, fistulous tract, missing teeth, restorations and denture provided. To record the tooth injury, the classification of Ellis (Ellis et al 1970)[12], as modified by Holland (Holland et al 1998)[13] was used:

Class 1: Fracture of enamel only.
Class 2: Fracture of enamel and dentine, without pulp involvement.
Class 3: Fracture of enamel and dentine with pulp involvement.
Class 4: Discolorations of the tooth, with or without a sinus.
Class 5: Displacement, extrusion, intrusion, and lateral displacement.
Class 6: Tooth loss as a result of trauma.
Class 7: Tooth restored by composite or crown following fracture.

Subjects who had clinical evidence of traumatic dental injury were interviewed for details of the injury event by using a structured questionnaire. Thus information concerning sex, age, type of fracture, cause of fracture, number and the type of injured tooth were recorded. Parents were not present during the examination. The data was collected and subjected to statistical analysis by means of SPSS (PC Version 10). The Chi-square test was used to compare qualitative data and determine statistical significance. The level of significance was set at 5%.

RESULTS

A total of 1515 children of which 855 (56.4%) were boys and 660 (43.56%) were girls were analyzed. The prevalence of traumatic injury was found to be 67.35% and 32.65% for boys and girls respectively (Table 1).The difference in occurence of injury in boys and girls was statistically significant .(p =0.039)The most common type of injury found in this study was enamel fracture alone, accounting to 64.97% of the total injury. Other types of dental injuries were less common. It is seen that both male and female children have a higher prevalence of Class I type of fracture followed by Class II and Class III (Table 2). The commonest cause of dental trauma in this study was due to falls (42.86%). Biting into hard objects was the least common cause of dental trauma (0.34%). Bicycling (22.1%), and road traffic accidents (9.18%) were the other causes resulting in the dental injuries (Table 3). The upper maxillary central incisors (63.95 %) showed a higher proportion of fracture than other teeth. The second most injured teeth in this study were the maxillary lateral incisors (Table 4).

DISCUSSION

The prevalence of dental trauma among children and adolescents has increased recently.[14] The age group of 9-13 yrs was chosen for the study, as in this period the occurrence of trauma to children is more. An element of error could have been introduced in the study as a result of it being undertaken in urban schools only. However, the present study concentrated on dental injuries of children living in urban lifestyle. Holland's modification of Ellis classification was used in this study as it is a simplified classification and has been used in various studies for recording dental trauma. In this study, parents were not involved but the children were questioned if there was trauma and their answers were considered to be reliable. It is important to highlight that different methodologies have been used in various studies, so caution should be taken when comparing various studies.

A prevalence of 19.41% of trauma to anterior permanent teeth is seen in this study, but studies from North Jordan, Syria[15]have shown a lower prevalence of 11%. However, higher incidence of anterior teeth trauma was reported in European countries ranging from 25 to 35%.[16]which may be due to children involved in contact sports .In this study, male to female ratio who experienced dental traumatic injuries than female patients is 2:1. Most authors suggest an association between male gender and dental trauma, attributing this difference to their more intense participation in contact sports, behavioral differences, car accidents, teasing during everyday outdoor activities and fights.[17,18] The relatively low prevalence of trauma among girls can be explained by the fact that girls are generally more mature in their behaviour than boys, who tend to be more energetic

and inclined towards vigorous outdoor activities.[19]However, Zadik(1976) [20] and Garcia-Godoy (1984) [21] did not find significant gender-based differences in their studies.

The upper maxillary central incisors (63.95 %) showed a higher proportion of fracture than other teeth. Previous studies done in Australia[22], Domnicus [23]and Cophenagen [16] also contended that the teeth most commonly injured were the maxillary central incisors. The second most injured teeth in this study were the maxillary lateral incisors which is concurrent with all studies except that by Forsberg and Tedestam, [24] where mandibular central incisors were the second most frequently injured teeth.

The most commonly identified forms of injury in the present study was fractures of the enamel only (Class I) followed by enamel dentine fractures Class II. This is in agreement with observations of other studies.[24, 25]

In the present study, the reason for dental injury was falls followed by sports and accidents which is concurrent to previous reports.[27,28,29]The use of protective gear including mouth guards which help distribute forces of impact which thereby reduce the risk of severe injury have been encouraged. An earlier study by Marcenes *et al* [15] reported that violence (42.5%) was the most common cause of injury.

20% of children had undergone treatment whereas others were not treated. This may be due to lack of pain which could have initiated treatment or parents were not aware of the dental treatment.

It should be kept in mind that it is extremely difficult to compare the results of the different investigations of dental injuries, partly because information is lacking or inaccurate .Further the studies are based on specific groups (age, class and location) or comprise trauma patients exclusively as well as the trauma classifications terminology and the data recorded differ substantially from study to study.[1]

CONCLUSION

The prevalence of traumatic dental injuries Chennai is high and its impact on children's daily life is substantial .Hence injuries to the permanent dentition have great potential to be considered as an emerging public health concern. Therefore health promotion policies should aim at creating an appropriate and safe environment for children.

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Table 1: The number and proportion of children with traumatized incisor tooth:

Group	Boys	Girls	Total	
Number f participants	855 (56.44%)	660 (43.56%)	1515	
Participants with traumatic injury:	198 (67.35%)	96 (32.65%)	294	19.41%

Table 2: Distribution of the different classes of injury:

Class of Injured	**Number**	**Percentage**
Class I	191	64.97%
Class II	67	22.79%
Class III	24	8.16%
Class IV	7	2.38%
Class VI	5	1.7%
Total	294	100%

Table 3: Cause of Trauma :

Cause	No of Children	Percentage	Boys	Girls
Fall	126	42.86%	94	36
Bicycling	65	22.11%	38	23
Sports Accidents	47	15.99%	35	12
Traffic Accidents	27	09.18%	21	6
Violence	9	3.06%	7	2
Biting	1	0.34%	1	-
Unknown	19	6.46%	7	12
Total	294			

Table 4: Higher Proportion of Fracture among Tooth:

Type of Permanent Teeth	9-13 years	Percentage
11,21	188	63.95%
12,22	54	18.37%
13,23	2	0.68%
31,41	31	10.54%
32,42	19	6.46%
33,43	-	