



PREVALENCE OF ANTERIOR TOOTH TRAUMA AMONG SCHOOLCHILDREN IN LUCKNOW AND ITS SUB URBAN AREAS: A SURVEY

Dental Science

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ABSTRACT

Trauma to the anterior teeth is a common finding in children and adolescents. In most of the cases when timely intervention is not considered, the tooth becomes nonvital and the pulp becomes necrosed which ultimately results in the formation of an irreversible periapical pathology. Hence, this study was envisaged to measure the prevalence of trauma in anterior permanent teeth among 1060 schoolchildren in Lucknow and its sub urban areas between 8-12 years of age. The total prevalence of dental trauma was 24.53%. In which, mild trauma was reported to be 17.93% while severe trauma (involving dentine) was 6.60%. Severe trauma was more prevalent among boys; children with lip incompetence and those with an over jet of 4 mm or more. The main reported causes for dental trauma were falling (35%), sports (20%), violence (20%) and playing (25%). Severe dental trauma was related to over jet, lip incompetence and gender. The etiological factors for trauma observed in this study were preventable. Therefore, a community effort should be pursued, with the aim of educating sports teachers, teachers, health personnel, parents and schoolchildren regarding awareness of dental trauma prevention.

KEYWORDS

Dental Trauma, Anterior Tooth Trauma, Tooth Injury

INTRODUCTION

Dental trauma is one of the most serious oral conditions; especially among children¹⁻⁴, causing fracture or loss of a child's anterior teeth, which has great psychological impact on both parent and the child, especially when the injury affects permanent teeth, and loss of extensive tooth structure is involved. It arises in a variety of situations, the most frequent being sudden severe trauma in the form of a fall, a blow, an automobile accident, accidents while participating in sports and childish pranks and sometimes child abuse leading to emergency dental visits. With the decrease in prevalence of caries^{5,6}, dental trauma, an irreversible pathology, has now achieved more deserved attention by the dental profession⁷. Dental trauma among children has been described in the literature in many countries, and is related with gender, orthodontic factors, sport activities and psychosocial environments⁸⁻¹¹. The objectives of the present study were to study the prevalence of dental trauma among schoolchildren of Lucknow and its sub urban areas and to investigate associations with its potential causes among the children.

MATERIALS AND METHOD

The schools and colleges were motivated to send their students for examination. A total of 1060 students between the age group of 8 to 12 visited the college. All dental examinations were conducted within the dental college. A standard dental mirror, small flashlight and a small millimetre ruler were employed. Informed consent was received from parents /guardians. Lip competence was recorded by observation of children's appearance as they entered the room and was defined as 'competent', or 'incompetent' if the lips were naturally closed or apart, respectively. Anterior over jet was measured (in millimetres), employing a small ruler and measuring the horizontal distance between upper and lower central incisors. Circumstances leading to dental injury events were evaluated by interviews with parents of the children. These included the location of the traumatic incidences (home, school, 'outside', other) and the causes of trauma (fall, sport, violence, play, and blow from object, bicycle or, other).

Trauma was scored in the following manner:

- 0 = no evidence of trauma
- 1 = trauma limited to the enamel
- 2 = trauma involving dentine

- 3 = trauma involving the pulp
- 4 = treated trauma, which had clearly involved (at the least) the dentine
- 5 = discoloration due to trauma
- 6 = avulsed tooth due to trauma

In subsequent analysis, these categories were operationally redefined and combined into three groups. The basis was whether the teeth were healthy, had experienced mild trauma limited to the enamel and not requiring emergency treatment, or teeth which had experienced trauma involving at least the dentine and which demanded treatment. On this basis, the following categories were employed:

- 1 = no evidence of trauma (score 0)
- 2 = mild trauma (score 1)
- 3 = severe trauma (scores 2-6).

RESULTS

A total of 1060 children were included in the study. Of these, 636 (60%) were boys and 424 (40%) were girls. The ages of children ranged between 8 and 12 years. As illustrated in Fig. 1, among 75.47% of all the children no trauma were detected, mild trauma was found among 17.93% and severe trauma among 6.60% of the examinees.

The predominant cause reported for severe dental trauma was falling (35: 18% at home, 9% at school, 8% outside), followed by sport (20%: 3% at home, 12% at school, 5% outside), violence (20%: 4% at home, 7% at school, 9% outside) and playing (25%: 4% at home, 9% at school, 12% outside). More falling events were reported at home, more sport injuries at school and more 'playing' injuries 'outside'.

Fig 1: % Distribution of trauma among children

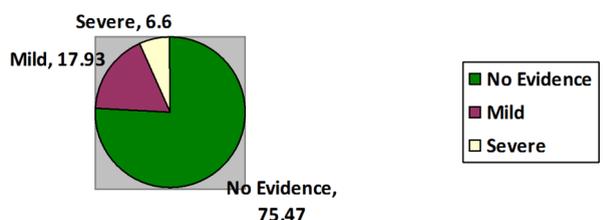


Table 1: Distribution of trauma by gender. Boys had more severe trauma (7.39%) than girls (5.42%).

Trauma	Males (%)	Females (%)	Total (%)
No evidence	456 (71.70%)	344 (81.14%)	800 (75.47%)
Mild	133 (20.91%)	57 (13.44%)	190 (17.93%)
Severe	47 (7.39%)	23 (5.42%)	70 (6.60%)
Total	636 (100%)	424 (100%)	1060 (100%)

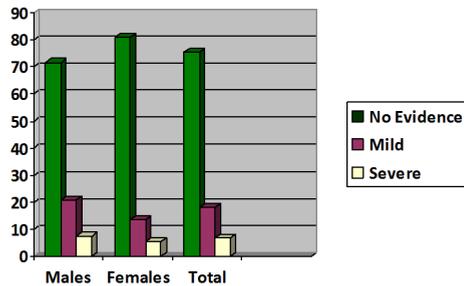


Fig 2: % Distribution of trauma by gender

Table 2: Distribution of trauma by lip competence. Children with incompetent lips had more severe trauma 11.59% than children with competent lips 3.92%.

Trauma	Competent (%)	Incompetent (%)	Total (%)
No evidence	560(81.28)	240(64.69)	800 (75.47)
Mild	102 (14.80)	88 (23.72)	190 (17.93)
Severe	27 (3.92)	43 (11.59)	70 (6.60)
Total	689 (100)	371 (100)	1060 (100)

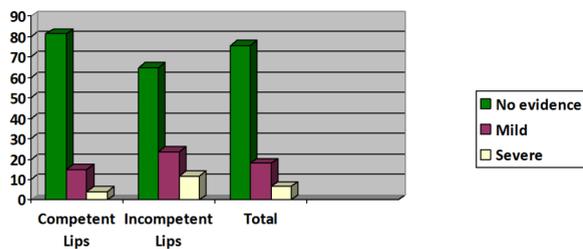


Fig 3: % Distribution of trauma by competency of lips

Table 3: Distribution of trauma by anterior teeth over jet. Children with an over jet of 4 mm or more had more severe trauma (11.43%) than children with an over jet of less than 4 mm (3.44%).

Trauma	≤ 3mm (%)	≥4mm (%)	Total (%)
No evidence	520 (81.25)	280 (66.67)	800 (75.47)
Mild	98(15.31)	92 (21.90)	190 (17.93)
Severe	22 (3.44)	48 (11.43)	70 (6.60)
Total	640 (100)	420(100)	1060 (100)

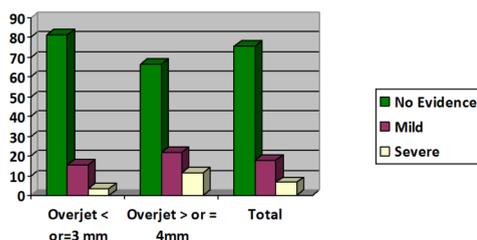


Fig 4: % Distribution of trauma by presence of overjet

DISCUSSION

Several studies have been conducted throughout the world by a number of investigators and these epidemiological surveys have reported a wide range of prevalence levels ranging from 4 – 46 % with 11-30% in primary dentition and 6-29% in permanent dentition. Children at the age of 1 to 2 ½ years sustain injuries to the primary dentition most frequently because at this age group they learn to toddle. There is no sex predilection at this age group because activities of both boys and girls are similar at this age group. School going children of 8 – 11 years show a high peak at this age group because they are most

engaged in sports in this age group. Boys are more prone to sustain injuries than girls are, the ratio being approximately 1.5:1. Teeth most commonly involved are upper central incisors (37%) followed by lower central incisors (18%), lower lateral incisors (6%) and upper lateral incisors (3%)¹². Sport accidents are fights affect teenagers and young adults, whereas auto accidents affect all age groups¹³. WHO suggests that the careless children are more prone to injuries. Some dentofacial deformities of children constitute accident-prone profiles and are more susceptible to injuries. They include increased overjet with incompetent lips, Angle's CI-II div 1 malocclusion and Angle's CI-I type 2 malocclusion. Children with cerebral palsy, epileptic patients and patients of dentinogenesis imperfecta because of having decreased micro hardness of dentine are also prone to injuries. In this study, only two parameters viz. lip competence and overjet were included.

The criteria for definition of dental trauma in many of the surveys are different, as are the age groups. Most indices usually differentiate according to level of dental tissue involved, i.e. enamel, dentine, pulpal exposure, extrusion, etc¹⁴⁻¹⁶. The present scoring system was employed due to its simplicity. It should be noted that this type of index might underestimate or overestimate the clinical prevalence of trauma, and inadequately differentiate between categories, as compared with diagnoses conducted under optimal dental clinic conditions. In the population, no significant association had been revealed between dental trauma and socio-economic background.

The present study demonstrated a total dental trauma ('mild' and 'severe') prevalence of 24.53%. Severe trauma was found among 6.60% of the schoolchildren (Fig. 1). Dental trauma was significantly more prevalent among boys; children with incompetent lips and with larger incisal over jet (Figs 1, 2 and 3). In general, the main reported cause for severe dental traumatic events in all surroundings was falling. Sports and violence were important causes at school and outside (but not at home). In the present study, most sport-related injuries were reported to occur at schools. Schools not only are one of the main locations of potential trauma, but also the environment where children's physical behaviours are often shaped. In this context, teachers, especially those involved in physical education, should be considered as important agents for public health interventions⁷. Other surveys of dental trauma have demonstrated associations with gender, lip competence, anterior incisal over jet, other orthodontic variables and sporting activities, similar to the results of the present survey^{11,17}. The main associated variables were gender, lip competence and anterior incisal over jet.

The data derived from this study are currently being employed in an organized municipal effort to educate teachers, especially those responsible for sports activities⁷, public health nurses, family doctors and schoolchildren, regarding dental trauma. This includes the aetiology, rationale for preventive intervention, with emphasis on mouth guards¹⁸, and early orthodontic treatment, where possible¹¹, and the treatment of teeth after traumatic experiences. All public health personnel should be impressed upon, regarding the general impact of dental trauma, including influence on all aspects of the adolescents' future life development¹⁹ and impact of those injuries on the social, behavioural and psychological development of children and adolescents.

CONCLUSION

It was concluded that the etiological factors for trauma observed in this study were potentially preventable. The efforts should be employed at community level, with the aim of educating, teachers especially sports teachers, health personnel, parents, guardians and schoolchildren regarding awareness of dental trauma prevention, with emphasis on utilizing mouth guards and early orthodontic intervention. They should also be taught about when and what to do immediately in case of trauma.

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