

PEDODONTICS

PREVALENCE OF FRACTURE OF PERMANENT INCISOR TEETH IN CHILDREN IN PESHAWAR

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ABSTRACT

A study was carried out on 13-year-old school children in three different zones (Town /Hayatabad, Gantt., City) of Peshawar city to determine the frequency of incisor fractures. Both maxillary and mandibular incisors were included in the study. Out of 300 children examined (150 Males and 150 Females) only 09 children (05 Males and 04 Females) had fractured their incisors (3%). There was a gradual decrease in the frequency of incisor fractures from zone-1 (Town /Hayatabad) to zone-3 (City). No significant difference was recorded in the frequency of incisor fractures between boys and girls. All of the 09 children had fractured their maxillary central incisors and all of them reported fall to be the cause of the fracture. Visually apparent labioversion (not measured) was found to have no effect on frequency of incisor fractures.

INTRODUCTION

Good-looking incisors are of great importance for the esthetics of young individuals. Apart from physical trauma, fracture of permanent incisor teeth cause psychological trauma as well. When a young child get his incisor teeth traumatized, the parents as well as the child are very anxious, as the young children do like to have esthetically good anterior teeth to avoid radicules from their classmates. Not only esthetics but also functional problems may arise.

Trauma to children's teeth occurs quite commonly. It has been reported that in some societies every second individual suffers a dental trauma during childhoods or adolescence^{1,5}. These high figures are linked to the intensity and type of traffic and sports activities and an increase in violence seen in these countries.

Dental injuries usually affect only a single tooth⁷, however, certain trauma types, such as automobile accidents and sports injuries, may cause multiple injuries^{4,8}. Maxillary central incisors are the teeth most commonly injured, while the mandibular central incisors and maxillary lateral incisors are next on the

list^{2,4,5,7}. The frequency of injury to incisors teeth is higher in boys than girls^{3,4,5,6}. This is due to the more active participation of boys in games and sports than girls.

The dense alveolar bone and smaller crown to root ratio in permanent dentition result in crown fractures more frequently than luxation injuries. Crown fractures comprise 26 to 76 percent of dental injuries in permanent dentition^{4,7,8}. The most common etiologic factors of crown fractures in the permanent dentition are injuries caused by falls (usually due to unorganized playing, i.e., children activities at home and schools etc), contact sports, bicycle and automobile accidents or foreign bodies striking the teeth^{4,8}.

Protruded upper incisors (increased overjet) and insufficient lip closure are reported to be important predisposing factors to traumatic dental injuries^{2,7}. Studies have shown that dental injuries are approximately twice as frequent among children with protruding incisors than children with normal occlusions and that the greatest number of injured teeth in the individual patient is associated with protrusive occlusion.

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MATERIALS AND METHODS

Pakistan Dental Association carried out a school dental health programme in Peshawar (Pakistan) sponsored by Lever Brothers Pakistan Limited (PDA-Pepsodent School Dental Health Programme) in March 1999. The staff members of Khyber College of Dentistry, Peshawar took part in this programme voluntarily (delivering lectures on oral health and clinical examination of children in schools). The present study was carried out simultaneously taking advantage of the facilities of the programme. The aim of the study was to determine the prevalence of fractured incisors in 13-year-old school children in Peshawar.

Three hundred (300) children of class 7th (13-year-old) were clinically examined in schools (male and female). Peshawar city was divided into three zones: Town/Hayatabad, Cantt and City. 100 children (50 males and 50 females) were examined in each zone. An attempt was made to include children from all social classes.

Clinical examination for fractured incisors was done in schools in natural light using ordinary chair and plain mouth mirror. Maxillary as well as mandibular central and lateral incisors were included in the study. Teeth which were traumatized but not fractured were not recorded. No attempt was made to determine the nature of the fracture (complicated or uncomplicated). Two separate examiners (one male and one female) were involved in the examinations. The examiners had to record whether an incisor was fractured or not, the cause and whether the child had apparant labioversion or not (without measuring). No inter or intra-examiner repeat examinations were carried out. The proforma used for the collection of data is shown in Fig 1.

PROFORMA FOR COLLECTION OF DATA

Name:	_____
Sex:	Male/Female.
Area:	Zone-1 (Town/Hayatabad) Zone-2 (Cantt.) Zone-3 (City)
Fractured:	21 12 21 12
Cause:	_____
Libioversion:	Yes/No

Fig. 1

RESULTS

Out of 300 children examined (150 Males and 150 Females), only 09 children (05 Males and 04 Females) had fractured their incisors (3%), Table 1. All of the 09 children had their maxillary central incisors fractured and all of them gave history of fall for their fractured incisors (Table 2 and 3).

Table 4 shows the number of children with fractured incisors in different zones. 100 children (50 Males and 50 Females) were examined in each zone. In zone-1 (Town/Hayatabad), only 05 children (02 Males and 03 Females) had fractured their incisors (5%). In zone-2 (Cantt.), 03 children (02 Males and 01 Female) had fractured their incisors (3%). In zone-3 (City), only 01 child (Male) had fractured incisor (1%).

The frequency of labioversion in children with fractured incisors is shown in Table 5. Out of the 09

TABLE 1: TOTAL NUMBER OF CHILDREN (MALES/FEMALES) EXAMINED AND NUMBER OF CHILDREN (MALES/FEMALES) WITH FRACTURED INCISORS

Number of Children	Males	Females	Total
Number of Children examined	150	150	300
Number of Children with fractured incisors	05	04	09

TABLE 2: NUMBER OF CHILDREN (MALES/FEMALES) WITH FRACTURE OF DIFFERENT INCISORS

Incisors	Males	Females	Total
Maxillary central incisor fractured	05	04	09
Maxillary lateral & Mandibular incisors fractured	0	0	0

TABLE 3: CAUSE OF FRACTURE IN CHILDREN WITH FRACTURED INCISORS

Cause of Fracture	Males	Females	Total
Fall	05	04	09
Other Causes	0	0	0

TABLE 4: CHILDREN WITH FRACTURED INCISORS IN DIFFERENT ZONES

Zones	Males	Females	Total
Zone-1	02	03	05
Zone-2	02	01	03
Zone-3	01	0	01
Total	05	04	09

TABLE 5: FREQUENCY OF LABIOVERSION IN CHILDREN WITH FRACTURED INCISORS

Yes / No	Males	Females	Total
Yes	01	03	04
No	04	01	05

children with fractured incisors, 04 children (01 Male & 03 Females) had apparent labioversion (44%) while in 05 children (04 Males and 01 Female) no labioversion had been recorded (56%).

DISCUSSION

This study is unique in its nature because it reports the prevalence of fracture of permanent incisor teeth in 13-year-old children rather than the prevalence of total injuries/trauma to the incisors. Teeth which were traumatized but not fractured were not included in the study. It may be difficult for this study to be compared with other studies firstly because no such study was done in Peshawar before and secondly majority of the studies worldwide usually measure prevalence of total injuries/trauma to the incisor teeth.

In this study, by the age of 13 years, 3% of children had suffered incisor injuries which resulted in fracture of crowns (Permanent Teeth). Ravn, J.J.⁷; Hedegard, B and Stalhane, I⁸ had reported that crown fracture comprise 26 to 76% of total dental injuries in permanent dentition. Combining this figure with the clinical experience of the auther, the prevalence of total incisor injuries may well be estimated for the present study to be somewhere between 5 to 6%. This is a much lower figure when compared with the studies of Mc Even et. al; York et al¹¹ and J.E. Todd¹² who reported the frequency of traumatic dental injuries in 11-13 year-old children to be 8.2%, 16-7% and 18% respectively. The

low frequency of coronal fracture of incisors reported in this study seems to be due to the lack of playgroundfracturesr sporting facilities in Peshawar because it has been reported that fall during playing is one of the most common causes of incisor fractureso. Indeed in this study all of the incisor fractures occurred due to fall. If we look at the results zonewise we find that majority of the incisor fractures occurred in zone-1 (Town/ Hayatabad), with zone-2 (Cantt.) next on the list. Zone-3 (City) has lowest number of cases with incisor fractures. The reason for this distribution of incisor fracture is understandable. Zone-1 is very spacious and comprise of planned towns with enough playing facilities (especially in schools). In City (zone-3), there is congestion and facilities for sports are very limited. In this study, the frequency of incisor fractures is almost equal in boys and girls (no significant difference).

This finding is not consistent with the studies of Todd, JE and Dodd, T³; Andreasen, JO⁴; Gelbier, S⁵; and Gutz, DP⁷ who reported a higher frequency for boys than girls. The reason again may be the same. In our society, girls don't play outside home and for boys there is lack of sporting facilities outside. The chances of all during unorganized playing at home remains the same for boys and girls.

In this study all of the 09 children had fractured their maxillary central incisor. This finding is consistent with studies of Jarvinen S², Andreasen, JO⁴, Gelbier S, Gutz, DP⁶, CH, and Ravn, JJ⁷.

Many studies have reported that protruded upper incisors (increased overjet) is an important predisposing factor to traumatic dental injuries^{2,7,8,2} and that dental injuries are approximately twice as frequent among children with increased overjet than children with normal occlusion. The results of this study are in agreement with the above studies only if we take the girls population alone but overall the results of this study have shown that increased overjet labioversion) does not affect the frequency of incisor fractures in children. This may be due to the fact that only visually apparent labioversion was recorded and the examiners may not be sensitive to minor protrusion.

Incisor injuries need prompt action both on part of the parents as well as the dentist. The parents have to be educated to take the child to the dentist as soon as the injury occurs. The dentist need to carry out the

treatment immediately rather than to indulge in supervised neglect.

Fracture of the enamel only represents approximately 47% of all crown fractures¹⁸. Sharp enamel margins should be rounded off to prevent soft tissue damage. Composite repair may be done if facilities and time permits. Coronal fracture involving enamel and dentine forms approximately 17% of all tooth fractures¹⁸. This type of fracture is often left untreated because initially the tooth is sensitive but there is no pain and the parents do not take the children to the dentist. Moreover, it is very unfortunate that majority of the dentists do not treat this type of fracture because they think that there will be no infection unless pulp is exposed. In fact, they are mistaken because infection of pulp can occur through dentinal tubules. When a child present with enamel and dentine fracture, the dentine should be covered immediately with composite resin to prevent the pulp from infection. Fractures involving the enamel, dentine and pulp account for approximately 5% of all episodes of trauma's. This type of fracture need immediate management. The success of treatment largely depends upon the time lapse between the injury and presentation and the size of exposure. The following techniques are available for treating the exposed pulp:

1. Direct Pulp Capping
2. Partial Pulpotomy
3. Vital (Cervical) Pulpotomy
4. Pulpectomy.

If a young tooth (open apex) had become non-vital then apexification is the method of choice for treating such tooth.

CONCLUSION

This study suggests that incisor fractures are not much prevalent in children in Peshawar and present no significant dental health problem. The frequency of

incisor fractures increases with increase in sporting activities. Maxillary central incisor is the most commonly fractured tooth in children and fall accounts for the majority of these fractures.

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REFERENCES

- 1 Andreasen, JO (1981). Traumatic injuries of the teeth, (2'd ed). Munksgaard, Copenhagen.
- 2 Jarvinen, S Incisal overjet and traumatic injuries to upper permanent incisors: A retrospective study. *Acta Odontol Scand* 36: 359, 1978.
- 3 Todd JE, Dodd T Children's Dental Health in the UK 1983. Office of population censuses and surveys, Social Survey Division. London: HMSO, 1985.
- 4 Andreasen, JO. Etiology and pathogenesis of traumatic dental injuries. A clinical study of 1298 cases. *Scand. J Dent Res* 78: 339-342, 1970.
- 5 Andreasen, JO & Ravn JJ Epidemiology of traumatic dental injuries to primary and permanent teeth in a Danish population sample. *Int. J. Oral Surg* 1: 235-239, 1972.
- 6 Gutz, DP Fractured permanent incisors in a clinic population *J Dent Child* 38: 94-121, 1971.
- 7 Ravn, JJ Dental injuries in Copenhagen School Children. School years 1967-1972. *Community Dent Oral Epidemiol.* 2: 231-245, 1974.
- 8 Hedegard, B and Stalhane, I: A study of traumatized permanent teeth in children aged 7-15 Part—I. *Swed Dent J* 66: 431-450, 1973.
- 9 Johnson, JE Causes of accidental injuries to the teeth and jaws. *J Pub Hlth. Dent* 35: 123-131, 1975.
- 10 O' Mullane, DM. Some factors predisposing to injuries of permanent incisors in school children. *Brit Dent J* 134: 328-332, 1973.
- 11 York, AIL Hunter, RM, Morton, JG, Wells, GM & Newton, BJ Dental injuries in 11-13 year old children. *NZ Dent J* 74: 218-220, 1978.
- 12 Todd, JE Children's Dental Health in England and Wales (1973). Her majesty's stationary office, 1975.
- 13 Roberts, G and Longhurst, P. Oral and dental trauma in children and adolescents. Oxford Medical Publications, Oxford University Press Inc., New York, 1996.