Tooth Crown Fractures in 3-year-old Andalusian Children

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ABSTRACT

Purpose: The purpose of this study was to determine the prevalence of tooth crown fractures affecting primary incisors of 3-year-old Andalusian children.

Methods: Clinicians examined 337 three-year-old children (mean age = 3.6 years) of Seville, Andalusia, southern Spain. They examined the children for several dental and oral conditions, including tooth trauma.

Results: Crown fractures were found in 15% of the examined children. The prevalence of tooth crown fractures was significantly higher in males (18%) than in females (10%) (p < .04; odds ratio 0.5). In both genders, the upper central incisors had the most fractures, 77% in males and 71% in females. The most common crown fracture was found in enamel only (82%), followed by fracture into dentin (12%), and fracture involving the dental pulp (7%).

Conclusions: Dentists have a responsibility to examine primary tooth injuries at the initial presentation of children because a dental injury to a primary tooth may include more severe injuries, such as deno-alveolar fractures. (J Dent Child 2003; 70:55-57)

KEYWORDS: DENTAL INJURY, TOOTH CROWN FRAC TURES, PRIMARY TEETH

Traumatic injuries to primary teeth occur with a very high frequency. The classic study of Andreasen and Raviv established that 30% of Danish children had sustained dental trauma before 7 years of age. Rates of traumatic injuries to primary teeth have been measured in other countries: Israel 11%, 3 Dominican Republic 35%, 4 Iraq 24%, 5 Nigeria 31%, 6 and South Africa 15%. 7 These rates corroborate that the prevalence of dental trauma in pre-school children is a continuing clinical and dental public health problem. Most of the dental trauma affecting primary incisors involve children younger than 4 years with maximal frequency at 3 years. 8

From previously published work, it is clear that more attention has been given to injuries of permanent teeth than of primary teeth, probably because primary teeth eventually exfoliate. However, considering the close proximity of the developing permanent tooth germ, traumatic injuries to primary teeth can affect the development and eruption of the permanent teeth. 9,10 Moreover, the immediate and long-term consequences in the primary dentition comprise: color changes (53%); premature tooth loss (46%); pulp canal obliteration (36%); pulp necrosis (25%); permanent displacement after luxation (5-22%); and pathological root resorption (1-10%). 11

Although several reports on the prevalence of primary teeth trauma in Northern Europe are available, 12 reports of trauma frequencies and types of injuries in primary teeth in South European communities are less available than reports of permanent tooth injuries. The purpose of this study was to determine the prevalence of tooth crown fractures affecting primary incisors of 3-year-old Andalusian children.

METHODS

Three hundred and thirty-seven 3-year-old children, 192 males (57%) and 145 females (43%) (mean age = 3.6 years) were studied. The children attended 7 urban nurseries of the Consejería de Asuntos Sociales de la Junta de Andalucía in Seville. The pregnant and the appropriate health departments granted permission to examine the children. Clinicians noted the gender and age of each child. Trained staff interviewed mothers and childcare workers using a structured questionnaire with questions on possible tooth injury for each child. The children were examined for several dental and oral conditions, including tooth trauma. Two experienced and calibrated clinicians completed the clinical examinations. The presence of tooth crown fractures was registered according to the index of Hargreaves and Craig. 13 (eg. fracture of enamel only, fracture involving dentin, and fracture involving the dental pulp.)

All recorded data were analyzed with the program GraphPAD InStat 1.0, edited by GraphPAD software. The critical level of statistical significance chosen was P<.05.

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RESULTS

The examination of the children demonstrated that 49 (15%) showed a primary tooth with a crown fracture. The prevalence of tooth crown fractures was significantly higher in males than in females (P=0.04; odds ratio=0.5) (Table 1). Thus, 18% of males and 10% of females showed any tooth crown fracture. Most children (84%) had only one tooth injured and less than 5% of children had more than 2 fractured teeth (Table 2).

Among the 60 fractured teeth 43 (72%) were in boys and 17 (28%) were in girls. The upper central incisors were the most frequently fractured teeth (73%), found in 77% of the fractured teeth in boys and 71% of the fractured teeth in girls (Table 3). Upper lateral incisors were the second most frequently fractured teeth (13%). Upper canines and lower lateral incisors were the least frequently fractured teeth (2%). Gender was not statistically significant (P=0.05).

Forty-eight (80%) of the 60 fractured teeth had a Grade I enamel fracture and only 7% of fractures involved dental pulp (Table 4). Gender was not statistically significant (P=0.05).

DISCUSSION

The overall prevalence rate of tooth crown fractures in 3-year-old children of Seville, Andalusia, Southern Spain, (15%) shows that 1 in 7 children damages a primary tooth. This rate is similar to the rates in South Africa 4 and the 3-year-old children in Andalusian children was lower than that found in children in Santo Domingo, 7 Nigeria, 8 and Denmark, where it was 1 in 3 children, and Iraq, where the rate was 1 in 4. However, the overall rate was higher than in Israel, 2 where it was 1 in 9 children.

This study found significant differences in tooth trauma rates between boys and girls. The prevalence of tooth crown fractures in males (18%) was almost twice that of females (10%) (P<0.05). Moreover, 72% of the fractured teeth were in boys and only 28% in girls. Although some previous investigations did not find significant differences between both genders, 2, 3, 5 other previous reports also found that traumatic injuries to teeth were statistically higher for boys than for girls. 1, 2, 4, 5, 13 The higher rate of dental trauma in boys could be explained by more frequent physical contact in their games. 1, 2, 5

The maximal frequency of crown fractures in the upper central incisors is in agreement with previous reports. 10, 11 Rates of injury to the primary dentition have been reported at similar rates in the permanent dentition of children in Denmark 1 and South Africa. 12 In Andalusian children both rates were also similar. 10

This investigation evaluated the traumatic injuries to the primary dentition causing tooth crown fracture. The fact that crown fractures are common consequences of dental trauma suggests that dental trauma in preschool children is a continuing and dental public health problem. Moreover, the study carried out by Andreasen 14 showed that 27% of traumatic injuries to the primary dentition caused crown fracture. Considering that the same proportion of crown fractures was found among the 3-year-old children in Seville, our results indicate that almost 50% of these children could have suffered dental trauma to the primary dentition.

CONCLUSIONS

While the trauma rate was relatively high in many of the reported studies, the severity of trauma was minimal. Fracture
REFERENCES


