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Original Article

Exploratory Study of the Prevalence of Traumatic Injuries in Preschool Children in the City of Macapá, Brazil

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Abstract

Objective: To verify the prevalence of dental trauma and the most common types of trauma in primary dentition of preschool children in the city of Macapá, Brazil. **Material and Methods:** A convenience sample of 177 preschool children aged 1-4 years of both genders was examined. Data collection occurred in public schools in different regions examiner. For comparison of data, statistical Chi-square test was applied, arranged in order of frequency ($p < 0.05$). **Results:** The prevalence of traumatic injuries was 46.3%, there was no statistically significant difference between genders ($p = 0.09$). The least affected age group was 1 year old ($p < 0.001$). The most common type of injury was enamel fracture (88.3%) and the most affected teeth were upper central deciduous incisors (70.1%) and upper lateral deciduous incisors (17.6%). **Conclusion:** Due to the high prevalence of dental trauma in this population, preventive and educational measures are needed to reduce the number of cases both in the private network and in promotions of public and community health.

Keywords: Dental trauma; Dental injuries; Epidemiology; Primary tooth.

Introduction

A major problem in the clinical practice of pediatric dentists are traumatic injuries in primary teeth due to their aesthetic and functional impacts [1,2]. Dental trauma can cause pain, loss of masticatory function and negative impact on the quality of life of children [3,4].

These lesions occur through impact that causes a sharp force transmission in tooth supporting tissues, compromising aesthetics, function, tissue biology, occlusal physiology and endanger tooth vitality and integrity [5,6].

There are some epidemiological studies showing a high prevalence of dental trauma among preschool children affecting deciduous teeth [6-11], and this problem can even generate future problems in permanent teeth [12]. Thus, immediate and adequate care by trained professional should be performed to avoid these possible sequelae [8].

Given the relevance of this subject, the aim of this study was to evaluate the prevalence of traumatic injuries in primary teeth of preschool children in the city of Macapá, Brazil, verifying age, gender, most affected teeth and most frequent type of trauma in this population.

Material and Methods

A cross sectional study was conducted with a convenience sample of children aged 1-4 years of both sexes attending public schools located at different regions of the city of Macapá, Brazil. Parents and / or guardians signed the informed consent form agreeing with the participation of children in the study.

Data collection took place in classrooms, where clinical exam was performed in 177 children by a single examiner. This examiner was specialist in Pediatric Dentistry and was previously trained and submitted to intra-examiner Kappa test established with the revaluation of 17 children (10% of the sample) to minimize errors and ensure quality in the diagnostic record.

For the performance of exams, children were accommodated in chairs and / or when required by retaining in the knee-to-knee position [13], with ambient lighting and to facilitate viewing, cleaning was performed with gauze slightly moistened in saline.

The prevalence of traumatic injuries in primary teeth was verified through the Classification of the World Health Organization modified [8], which includes enamel fracture, enamel and dentin fracture, enamel crack, subluxation, dislocation, concussion and dental avulsion.

The diagnosis was recorded by an oral hygiene technician properly trained to fill the medical record, considering gender, age, type of trauma and most affected teeth, already used in other studies [8].

Data were tabulated in Excel Windows 7 software and subsequently, prevalence rates and descriptive statistics were assessed using the Minitab R software version 14.2 for the chi-square test to associate trauma with gender and age, arranged in the form of frequency with $p < 0.05$. This study was approved by the Ethics Research Committee of the Cruzeiro do Sul University (Protocol No. 059/2010).

Results

The intra-examiner Kappa value was 0.92 for the examiner's agreement. The sample consisted of 177 children aged 1-4 years, 44 of them (24.9%) aged 1 year, 46 (26.0%) aged 2 years, 59 (33.3%) aged 3 years and 28 (15.8%) aged 4 years. Among these children, 86 (48.6%) were male and 91 (51.4%) were female.

Of the children examined, 46.3% had some type of dental injury (Table 1), with enamel fracture as the most frequent injury (88.3%) as shown in Figure 1, and no significant difference between genders was observed ($p = 0.09$), as shown in Table 2.

Table 1. Number of patients with or without dental trauma by age.

Age	With dental trauma	Without dental trauma	Total
1 year *	10 (22.7%)	34 (77.3%)	44 (100%)
2 years	24 (52.2%)	22 (47.8%)	46 (100%)
3 years	30 (50.9%)	29 (49.1%)	59 (100%)
4 years	18 (64.3%)	10 (35.7%)	28 (100%)
Total	82 (46.3%)	95 (53.7%)	177 (100%)

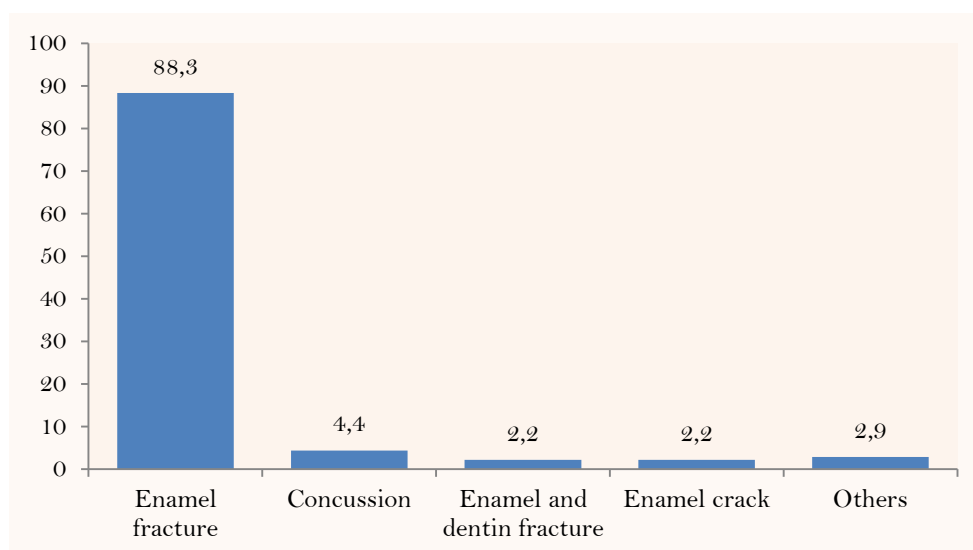


Figure 1. Types of dental trauma.

Table 2. Number of patients with or without dental trauma by gender.

Gender	With dental trauma	Without dental trauma	Total
Male	46 (53.5%)	40 (46.5%)	86 (100%)
Female	36 (39.6%)	55 (60.4%)	91 (100%)
Total	82 (46.3%)	95 (53.7%)	177 (100%)

Chi-square test: $\chi^2 = 3.449$ ($p=0.09$)

It was observed that the most affected teeth were the upper deciduous incisors, 51 (38.7%) and 61 (31.4%), as shown in Figure 2.

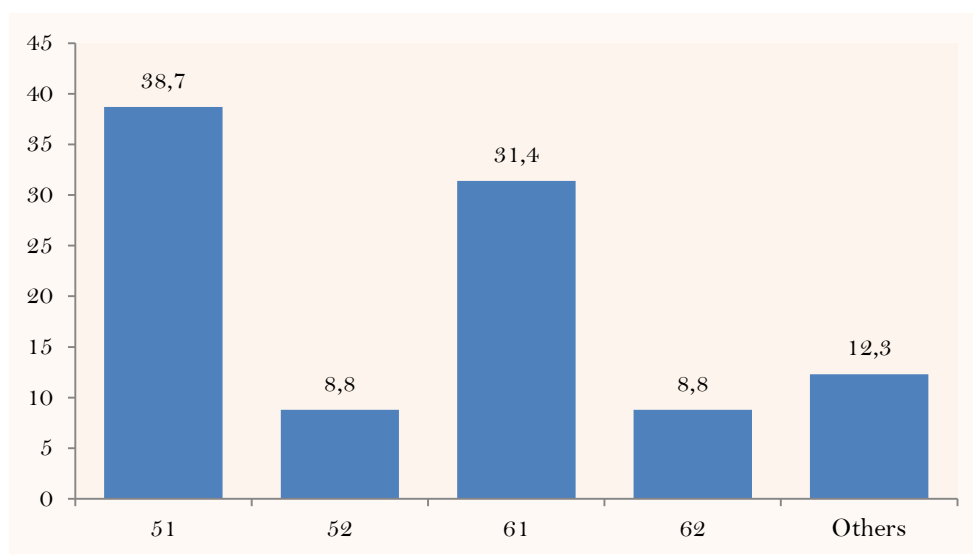


Figure 2. Teeth affected by trauma.

With respect to age (Table 1), children aged 1 year were those who reported the lowest prevalence of dental trauma ($p = <0.001$).

Discussion

Considered a major oral health problem due to its high prevalence and physical and emotional consequences [6], dental traumatic injuries when occurred in the primary dentition can lead to malformation of the dental element or even interrupt the development of the successor permanent tooth [12,14]. The occurrence of these injuries is quite common in preschool children, since children still do not have good motor coordination to avoid possible falls [8]. Despite the relevance of this problem in the primary dentition, studies are mostly focused on injuries in permanent teeth [6].

The findings of this study showed that of the sample of 177 preschool children examined, 82 had some type of trauma, with prevalence of 46.3%. This prevalence was higher than that found in another study (38.2%), which used the same methodology and evaluation criteria [8]; possibly this difference occurred due to sample variation, since one of the limitations of the present study was the amount of sample assessed for being an exploratory study, but other studies have shown similar prevalence of dental trauma in children at the same age in other regions of Brazil [15,16]. Another study conducted in 2005 also in the city of Macapá with preschool children associated the prevalence of dental injuries with socioeconomic factors and malocclusions and showed a prevalence of only 6.7%; this difference was possibly due to the different indexes used for the diagnosis of traumatic injuries among these studies [17].

Males showed a prevalence of 53.5% while for females, this prevalence was 39.6%; however, no significant difference between groups was observed, which is in agreement with other studies [6,16-18]. Regarding the most frequent type of injury, enamel fractures were the most frequent, corroborating other studies [8,17,19].

According to the location of teeth most affected by traumatic injuries, the literature shows that upper central incisors are the most affected teeth, with no significant differences between left and the right sides, which is due to their position in the dental arch [6,8,18]. In the present study, upper central deciduous incisors teeth accounted for 70.1% of affected teeth, and according to the modified classification of the World Health Organization [8], both upper and lower teeth were assessed, which is a more accurate method for the diagnosis of dental trauma compared to the assessment of only the upper arch [20].

The occurrence of dental trauma may also be related to clinical factors such as teeth malocclusion, severe overjet, inadequate lip coverage [7,20,21].

From the first year of life, when children begin to learn more about the environments, the risk of the occurrence of some type of trauma is greater [19]. Since trauma is a problem that leaves sequelae, the older the age investigated, the higher the likelihood of finding this problem. However, due to lack of design of studies and the use of many different indexes and criteria for diagnosing this problem, there is still plenty of disagreement about this relationship. In the present study, children up to 1 year of age showed prevalence of 22.7%, while children aged 2, 3 and 4 years had prevalence higher than 50%. There is a slightly higher prevalence among children aged 2 years compared to those aged 3 years, which was a random finding in this study group.

Due to the high prevalence of traumatic injuries in primary teeth and knowing the relevance of this problem that can affect permanent teeth, which would raise the cost and time of treatment, pediatric dentists should be familiar with clinical and epidemiological aspects for the adoption of preventive and curative measures of this oral health condition.

Conclusions

The prevalence of dental trauma in the group of preschool children in the city of Macapá was 46.3%. The most affected teeth were the upper deciduous incisors and the most frequent type of injury was enamel fracture. Due to the high prevalence, educational and preventive measures should be adopted in order to reduce the prevalence of traumatic dental injuries.

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