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A Retrospective Assessment of Pediatric Dental Trauma Patients Before and During the COVID-19 Outbreak

Pediatrik Diş Travması Hastalarının COVİD-19 Salgını Öncesi ve Sırasında Retrospektif Olarak Değerlendirilmesi

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ABSTRACT

Objective: The aim of this study was to compare the number of patients admitted to the Department of Pediatric Dentistry at Atatürk University Faculty of Dentistry in 2020 due to dental trauma with the previous year, and to determine the causes and forms of trauma during the pandemic).

Methods: In this retrospective study, dental trauma records were evaluated. The number of patients admitted, their age, sex, type of trauma, location of the trauma, and the affected teeth were analyzed. The distribution of trauma cases over the years in terms of sex, dentition, jaw, and location was evaluated using Chi-square analysis.

Results: The incidence of dental trauma among the patients who visited our clinic in 2019 and 2020 was 0.35% and 0.83%, respectively. Enamel-dentin fractures from dental hard tissue injuries were the most common type of trauma in both years. No statistically significant differences were found in the distribution of trauma cases by year in terms of sex, dentition, jaw, and location ($p>0.05$).

Conclusion: The COVID-19 outbreak led to a reduction in dental trauma cases. However, it is noteworthy that dental traumas occurred more frequently in outdoor environments, despite restrictions on children going out due to the pandemic. Since no significant reduction in the frequency of dental traumas was observed during the COVID-19 outbreak in children, it is important to inform parents and children about avoiding certain risky behaviors and protection methods..

Keywords: COVID-19 outbreak, Pediatric dentistry, Dental trauma

ÖZ

Amaç: Bu çalışmanın amacı Atatürk Üniversitesi Diş Hekimliği Fakültesi Çocuk Diş Hekimliği Anabilim Dalı'na 2020 yılında diş travması nedeniyle başvuran hasta sayısını bir önceki yılla karşılaştırmak ve pandemi döneminde travmanın nedenlerini ve şekillerini belirlemektir.

Yöntemler: Bu retrospektif çalışmada diş travma kayıtları değerlendirildi. Başvuru yapan hasta sayısı, yaşı, cinsiyeti, travma tipi, travmanın yeri ve etkilenen dişler analiz edildi. Travma olgularının yıllara göre cinsiyet, diş, çene ve lokasyona göre dağılımı Ki-kare analizi kullanılarak değerlendirildi.

Bulgular: Kliniğimize 2019 ve 2020 yıllarında başvuran hastalarda diş travması görülme sıklığı sırasıyla %0,35 ve %0,83 idi. Diş sert doku yaralanmalarına bağlı mine-dentin kırıkları her iki yılda da en sık görülen travma tipiydi. Travma olgularının yıllara göre cinsiyet, diş yapısı, çene ve lokasyona göre dağılımında istatistiksel olarak anlamlı farklılık saptanmadı ($p>0,05$).

Sonuç: COVİD-19 salgını diş travması vakalarında azalmaya neden olmuştur. Ancak pandemi nedeniyle çocukların dışarı çıkması kısıtlanmasına rağmen diş travmalarının dış ortamlarda daha sık meydana geldiği dikkat çekiyor. Çocuklarda COVİD-19 salgını sırasında diş travmalarının sıklığında anlamlı bir azalma görülmediğinden, ebeveynlerin ve çocukların bazı riskli davranışlardan kaçınma ve korunma yöntemleri konusunda bilgilendirilmesi önemlidir...

Anahtar Kelimeler: COVID-19 salgını, Çocuk diş hekimliği, Diş travması

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INTRODUCTION

Since January 2020, the new coronavirus disease (COVID-19) or Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has been a major global public health problem. SARS-CoV-2 belongs to the family of betacoronavirus, which can cause serious illness and death. A new type of coronavirus, called SARS-CoV-2, is a positive single-stranded, enveloped large RNA virus that infects humans and various animals.[1]

Some patients with SARS-CoV-2 infection exhibit varying symptoms, while most are asymptomatic individuals. In symptomatic patients, fever, cough, nasal congestion, fatigue, diarrhea, and upper respiratory tract infections are among the clinical manifestations of the disease. Because COVID-19 disease is transmitted through particles or droplets, the diagnosis and treatment of oral diseases carry a direct risk of infection in the clinical setting. For this reason, most dental clinics around the world have suspended routine oral/dental treatments for a while to prevent the spread of cross-infection and epidemic. However, treatment was carried out with precautions for dental problems requiring urgent treatment.[2-6] Dental procedures that can be considered urgent in Pediatric Dentistry were defined as cases of continuous and severe tooth pain, extraoral swelling, and dental trauma in the decision of the Turkish Ministry of Health's Coronavirus Science Board on April 1, 2020.[7]

Traumatic dental injuries, one of the dental treatments requiring immediate intervention, can be caused by a direct or indirect force to the tooth. Common etiological factors of traumatic dental injuries include falls, motor vehicle accidents, and sports injuries. The teeth most affected by trauma are maxillary central incisors, and if overjet increases, the risk of trauma for these teeth also increases. Dental traumas affecting permanent teeth are typically observed in the hard tissues (crown, crown-root fractures, and root fractures) and the periodontal support tissues (luxation and avulsion), whereas soft tissue injuries are more prevalent in primary dentition. Traumatic dental injuries can affect tooth development in children, resulting in complications such as root resorption, pulp necrosis, ectopic eruption, hypoplasias, and displacements.[8-12]

Whenever possible, it is crucial to avoid non-emergency dental procedures to minimize the risk of COVID-19 transmission. The curfew measures imposed in the Republic of Turkey on individuals aged between 0-20 and 0-18 have resulted in a decline in visits to dental clinics, except for emergency cases.[13]

In order to assess the impact of these restrictions on dental trauma cases, we conducted a retrospective study to compare the number, causes, and types of traumatic dental injuries in patients who applied to the Department of Pediatric Dentistry at Atatürk University Faculty of Dentistry in 2020 with those in the previous year. The null hypothesis of the study is that there is no effect of the COVID-19 pandemic on the distribution of traumatic dental injuries in terms of the sex, dentition, jaw, and location of the trauma among patients applying to our faculty between 2019 and 2020.

METHODS

In this study, the dental records of patients who applied to the Department of Pediatric Dentistry at Atatürk University Faculty of Dentistry due to dental trauma in 2019 and 2020 were examined. The study was approved by the Ethics Committee of the Atatürk University Faculty of Medicine Research (Approval Nr. 29.12.2022/22). This study was conducted in compliance with the Declaration of Helsinki. Written informed consent was obtained from each subject and their parents to record the trauma case. Dental trauma injuries were examined following WHO guidelines.[14] Information regarding the number of patients, age, sex, type and location of trauma, and teeth affected by trauma were evaluated from the dental records.

The number of patients, age, type of trauma, and distribution of teeth affected by trauma were analyzed separately for each year and compared statistically. The distribution of trauma cases over the years in terms of sex, dentition, jaw, and location of the trauma was also evaluated.

All statistical analyses were performed using Statistical Package for Social Sciences (IBM SPSS Corp., Armonk, NY, USA) version 26.0. Fisher's exact test was used to compare categorical data for 2 by 2 tables, while the chi-square test was used for larger tables, with a significance level of 0.05.

RESULTS

The number of patients seeking treatment for dental trauma at our clinic in 2019 was 103 (34 females, 69 males). In 2020, during the pandemic, this number decreased to 69 (24 females, 45 males). Although dental trauma was more common in males in both years, there was no statistically significant difference between the sexes (p=0.810, Table 1). The incidence of dental trauma among the patients who visited our clinic was 0.35% (84 out of 24,347 patients) in 2019 and 0.83% (69 out of 8,349 patients) in 2020. In this retrospective study, the mean age of children was 7.8±4.2 in 2019 and 7.4±4.3 in 2020. Dental traumas in 2019 involved 175 teeth, while in 2020, 132 teeth were exposed to trauma.

Table 1. Distribution of traumatic dental injuries between the pre-pandemic and pandemic periods in terms of the sex, dentition and jaw.

		2019	2020	p
Sex	Male	69	45	0.810
	Female	34	24	
Dentition	Primary	59	38	0.400
	Permanent	113	90	
Jaw	Maxilla	147	101	0.140
	Mandible	25	27	

The distribution of trauma cases by trauma types is presented in Figure 1. The most common types of dental hard tissue and pulp injuries in both 2019 and 2020 were enamel-dentin fracture (25% for 2019; 22% for 2020) and complex crown fractures (11% for 2019; 16% for 2020). Among periodontal tissue injuries, the most common injury was lateral luxation injuries (19% for 2019; 23% for 2020), followed by avulsion (8% for both years).

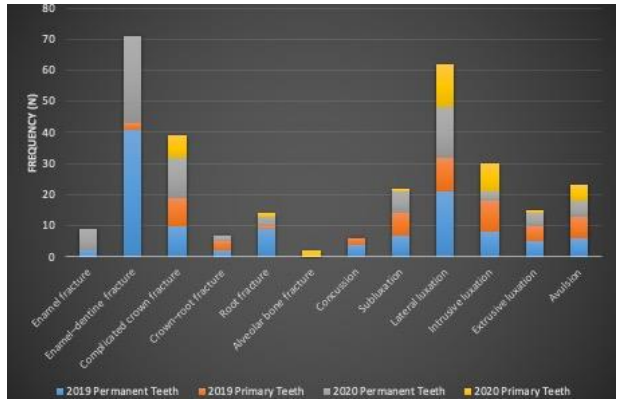

Figure 1. Distribution of trauma cases before and during the pandemic by trauma types.

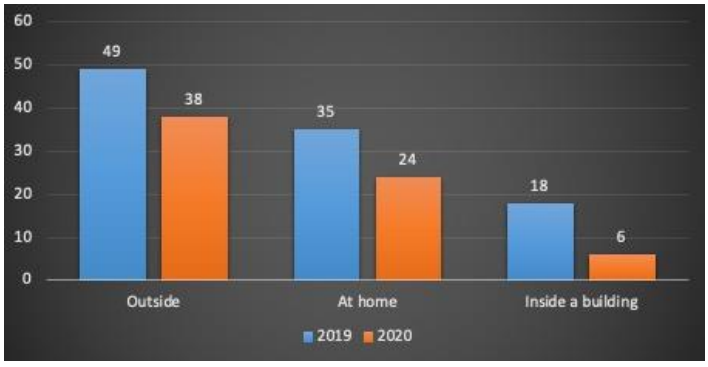

Figure 2. Distribution of trauma cases that occurred before and during the pandemic according to the location where they were observed

When the distribution of trauma cases according to the location of trauma (at home, outside, or inside) was examined (Figure 2), it was observed that 48% of traumas occurred outside in 2019, and this increased to 55% in 2020. There was no statistically significant difference between the years according to the location of the trauma cases (p=0.253).

While 34% of trauma cases in 2019 were observed in primary dentition and 66% in permanent dentition, these values shifted to 30% and 70%, respectively, in 2020. There was no statistically significant difference between the pre-pandemic and pandemic periods in terms of the dentition types in which trauma cases were observed (p=0.400, Table 1).

Upper central incisors were determined to be the most affected tooth by trauma in both primary and permanent dentition. While the highest number of traumatized teeth per person was 4 in 2019, it was determined to be 6 teeth in 2020. In addition, the mean number of traumatized teeth was 1.7±0.8 and 1.9±1.2 in 2019 and 2020, respectively. The incidence of dental trauma in patients who applied to our clinic was 0.72 teeth/100 children/year in 2019, and 1.58 teeth/100 children/year in 2020.

Upon examining the distribution of trauma cases according to the jaws in both years, it was observed that traumas were more frequent in the maxilla (85.5% in 2019, 78.9% in 2020), but no statistically significant difference was found between the two years (p=0.140, Table 1).

DISCUSSION

The COVID-19 pandemic has led to guidelines recommending postponement of non-essential dental treatments and prioritizing treatment for patients experiencing pain, swelling, bleeding, and trauma.[15] Pandemic-related restrictions, such as lockdowns, social distancing, and closure of schools and businesses has affected not only the incidence of dental caries but also traumatic dental injuries.[13] In this retrospective study, we aimed to evaluate the impact of pandemic-related restrictions on the number, causes, and types of traumatic dental injuries in pediatric patients.

It has been reported in the literature that there was a decrease in the number of patients presenting with trauma complaints during the Covid-19 period.[16-18] Although the number of patients admitted to our clinic due to traumatic dental injuries in 2020 compared to the previous year has decreased significantly, the incidence of trauma has increased. Similar to the study by Hahn et al.,[19] the increase in the incidence of trauma in patients who applied to our clinic in 2020 is due to the decrease in the number of patients who applied. This decrease may be attributed to pandemic-related restrictions, such as reduced outdoor activities, school closures, and decreased social interactions. However, curfews for those under 18 in Turkey did not seem to significantly affect the number of patients seeking treatment for dental trauma at our clinic.[13]

Although boys are generally more prone to dental trauma than girls, some researchers have reported that girls are at least as likely to be at risk as boys.[20] However, it is important to note that the majority of traumatic dental injuries in our study occurred in male patients, which is also consistent with previous studies.[21,22] The reason for this may be that boys engage in more risky and aggressive behaviors, such as participating in aggressive sports and displaying violent behavior.[23]

In many studies in the literature, it has been stated that the most common type of injury is uncomplicated crown fractures in permanent teeth and periodontal injuries in primary dentition.[24] In studies conducted during the Covid-19 period, it was stated that the most common type of trauma was crown fracture.[25,26] Similarly, in our study, the most common types of trauma in both years were enamel-dentin fractures in permanent teeth and lateral luxation injuries in primary teeth. The higher incidence of these types of injuries may be due to their association with falls and accidents that cause direct trauma to the teeth.

Dental injuries are typically observed on the anterior teeth, with a higher incidence in the upper incisors.[27] Similar to Covid-19 period literature, our findings show that the upper central incisors are the most commonly affected teeth by trauma in both dentition.[28,29] This can be attributed to their location in the front part of the jaw, which is less protected by the upper lip, as well as the lack of mobility in the upper jaw compared to the lower jaw. Furthermore, the prominent position of the upper central incisors in the arch and their susceptibility to direct trauma contribute to the high incidence of injuries [30].

It has been noted that traumatic dental injuries often occur in school, home, and outdoor environments [31]. In this study, it was observed that 48% of the traumas occurred in the external environment in 2019. Despite the curfew restrictions due to the pandemic, our findings imply that a majority of dental traumas in 2020 still occurred in external environments.

Finally, our study found no statistically significant difference in the distribution of traumatic dental injuries between the pre-pandemic and pandemic periods in terms of the sex, dentition, jaw, and location of the trauma. Therefore, the null hypothesis was accepted. This suggests that pandemic-related restrictions did not have a significant impact on the distribution of traumatic dental injuries in our patient population.

Our study has some limitations, including its retrospective nature and the reliance on dental records for data collection. In addition, we only included patients who presented to our clinic and may not have captured cases that were managed elsewhere or not reported at all. Future studies could use a prospective design and include a larger sample size from multiple clinics to provide a more comprehensive understanding of the impact of the pandemic on traumatic dental injuries.

CONCLUSION

While the COVID-19 outbreak led to a reduction in dental trauma cases, it is noteworthy that dental traumas occurred more frequently in outdoor environments despite restrictions on children going out due to the pandemic. Since no significant reduction in the frequency of dental traumas was observed during the COVID-19 outbreak in children, it is important to inform parents and children about avoiding certain risky behaviors and protection methods

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