



## INVESTIGATION OF THE RELATIONSHIP BETWEEN DENTAL TRAUMA IN CHILDREN AND SOME HEALTH PROBLEMS

Hande TEKİN<sup>a\*</sup>, Naz SAYDAM<sup>a</sup>, Zuhale KIRZIOĞLU<sup>a</sup>

<sup>a</sup>Department of Pedodontics, Faculty of Dentistry, Suleyman Demirel University, Isparta, Turkey.

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\*Correspondence: Hande TEKİN,

Department of Pedodontics, Faculty of Dentistry,  
Suleyman Demirel University, Isparta, Turkey.

e-mail: dthandeteekin@hotmail.com

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### ABSTRACT

Some of the reasons for being admitted to the clinic with the need for emergency treatment in dentistry are trauma-related injuries. Etiological factors include most frequently household accidents at young ages followed by falls/crashes and sports injuries. In addition to these factors, congenital/systemic diseases and the sleepiness and distraction caused by some drugs in relation to these, as well as neurological, behavioral and physical disorders seen in diseases like epilepsy, make children more prone to dental injuries. This study aimed to investigate the relationship between systemic/congenital diseases and drugs used in relation to these diseases and trauma of the permanent teeth. Files of 440 patients at the ages of 6-18 who visited the pedodontics clinic due to traumatic injury were examined. By determining those without any health problems and those with serious health problems and using medication for a long time from these files, the patients were grouped based on age, sex and the severity of traumatic injury. Considering the health problems, the ratios of the children with respectively asthma, epilepsy and cardiac disease were found to be higher. When traumatic injuries were separated as simple injuries and serious dental injuries that may end up in loss of teeth, it was determined that 61,2% of the children with health problems had severe dental injuries. As a result of our study, it was considered that serious health problems or related medication usage may be effective in trauma injuries seen in children. However, to make a clear conclusion on this topic, it is needed to conduct further studies.

### 1. Introduction

Today, the higher presence of children in social environments and their increased participation in sportive activities lead to observation of more frequent traumas. The effects of dental trauma experienced in the childhood and young adult periods where growth and development continue may lead to physical, aesthetic and psychological problems that would continue for the person's entire life. Studies that are conducted show that traumas happen before the age of 19 (1,2). Although it is not possible to prevent some of the factors effective in trauma development, it is possible to prevent or reduce the severity of some.

In dentistry, some of the reasons for visiting the clinic

for the need for emergency treatment are trauma-related injuries. Dental traumas constitute a large part of emergency dental treatments. It is seen that the incidence of traumas increases at the ages of 2-3 where children start to autonomously move and develop motor coordination and especially at the ages of 9-10 in the school period where their playing/sports activities increase.

In addition to household accidents, falls/crashes and sports injuries, the causes of traumatic tooth injuries may involve violence and the physical abuse of children (3). It is possible to prevent a part of these injuries with legal precautions to be taken, while others may be prevented by some treatments and apparatuses to be used by the dentist in the early period. In addition to these factors, congenital/

systemic diseases and the sleepiness and distraction caused by some drugs in relation to these, as well as neurological, behavioral and physical disorders seen in diseases like epilepsy, make children more prone to dental injuries. However, information on this issue is limited.

This study aimed to investigate the relationship between systemic/congenital diseases and drugs used in relation to these diseases and trauma of the permanent teeth.

## 2. Materials and Method

This study examined the files of 440 patients who were admitted to the Pedodontics Clinic of the Faculty of Dentistry at Süleyman Demirel University due to traumatic injury.

The files were separated into two groups as those without any health problems and those with serious health problems who were using medication for a long time. These groups were categorized based on age, sex and the severity of traumatic injury.

As the type of traumas that were experienced, those with concussion and crown fractures were determined as simple injury, while those with subluxation, lateral luxation, intrusion (int.), extrusion

(ext.) and avulsion injuries were determined as severe dental injuries.

The obtained data were tabulated.

## 3. Results

The files of the 440 children at the ages of 6-18 who were included in the study were examined. Generally speaking, the highest rates of injuries based on ages were seen at the ages of 6-8, followed by the ages of 9-10. When the injuries were divided into simple injuries and severe dental injuries that could result in loss of teeth, it was determined that approximately 50% of the children in the 9-10 age group had simple and approximately 60.5% of the children in the 6-8 age group had severe dental injuries. It was found that the age group where trauma was most seen in the children was 6-8, and the incidence of trauma decreased as age increased. The findings are shown in Table 1. In the distribution based on sex, more traumatic tooth injuries were seen in the male children (Table 2).

Considering the health status and dental injury types of the patients, it was seen that 36,1% of the healthy children had simple and 63,4% of them had severe dental injuries. Considering the files of the children

**Table 1.** The types of the dental injuries of the patients were investigated based on their ages (N=440)

Age	Simple Dental Injuries		Severe Dental Injuries					Total
	Crown Fractures N (%)	Concussion N (%)	Int. N (%)	Ext. N (%)	Lateral Luxation N (%)	Subluxation N (%)	Avulsion N (%)	N (%)
6-8	55 (12.5)	9 (2.0)	17 (3.9)	8 (1.8)	31 (7.0)	21 (4.8)	21 (4.8)	162 (36.8)
9-10	70 (15.9)	3 (0.7)	7 (1.6)	6 (1.4)	22 (5.0)	9 (2.0)	30 (6.8)	147 (33.4)
11-13	20 (4.5)	3 (0.7)	6 (1.4)	4 (0.9)	16 (3.6)	17 (3.9)	21 (4.8)	87 (19.8)
13-18	0	0	3 (0.7)	7 (1.6)	21 (4.8)	8 (1.8)	5 (1.1)	44 (10.0)
<b>Total</b>	145 (32.9)	15 (3.4)	33 (7.5)	25 (5.7)	90 (20.5)	55 (12.5)	77 (17.5)	440

**Table 2.** The types of the dental injuries of the patients were investigated based on their sex (N=440)

Sex	Simple Dental Injuries		Severe Dental Injuries					Total
	Crown Fractures N (%)	Concussion N (%)	Int. N (%)	Ext. N (%)	Lateral Luxation N (%)	Subluxation N (%)	Avulsion N (%)	N (%)
Girl	57 (13.0)	6 (1.4)	11 (2.5)	11 (2.5)	40 (9.1)	16 (3.6)	26 (5.9)	167 (38)
Boy	88 (20.0)	9 (2.0)	22 (5.0)	14 (3.2)	50 (11.4)	39 (8.9)	51 (11.6)	273 (62)
<b>Total</b>	145 (33)	15 (3.4)	33 (7.5)	25 (5.7)	90 (20.5)	55 (12.5)	77 (17.5)	440

with any disorder, it was seen that 38,9% of them had simple dental injuries as a result of trauma, while 61,2% of them had severe dental injuries. While the rate of avulsion injury where the tooth was completely extracted from its socket was 17% in the healthy children, this rate was 22,3% in the children with serious health problems (Table 3).

When the files were examined, it was observed that the children with serious health problems who were using medication respectively had asthma, epilepsy and cardiac disease. The patients in this group constituted approximately 8,2% of all the children included (Table 4).

#### 4. Discussion

It was stated that the etiology of traumatic dental injuries includes many risk factors such as household accidents, crashes-falls, traffic accidents and sportive activities (4-6).

In our study, it was seen that the pediatric patients mostly experienced trauma at the ages of 6-8, the tips of the roots are not closed yet at these ages, and

alveolar growth continues. In the future, this will raise problems regarding dental, maxillomandibular, aesthetical problems and problems regarding long-lasting treatments. Moreover, if there is also a health problem in the child, this situation will raise other additional issues. For this reason, it is important to know about the incidence of trauma in these diseases. However, there is no study on the effects of systemic/ congenital diseases in children and some drugs used in relation to these on trauma experiences. Therefore, this issue was aimed to be determined by examining trauma files.

In the comparison of the trauma rates of the healthy and unhealthy children, it was seen that these rates were similar. However, considering trauma types, the crown fractures, extrusion and avulsion rates in the children with health problems were higher than those in the healthy children. In the comparison of the trauma types within this group, it was seen that the avulsion injuries had a higher rate. However, as the numbers that were obtained were low, it is not possible to talk about a clear conclusion.

**Table 3.** Health status of the patients and dental injury types (N=440)

Health status	Simple Dental Injuries		Severe Dental Injuries					Total
	Crown Fractures N (%)	Concussion N (%)	Int. N (%)	Ext. N (%)	Lateral Luxation N (%)	Subluxation N (%)	Avulsion N (%)	N (%)
Healthy	131 (29.8)	15 (3.4)	32 (7.3)	21 (4.7)	83 (18.9)	53 (12.0)	69 (15.7)	404 (91.8)
Systemic / Congenital Disease	14 (3.2)	0	1 (0.2)	4 (0.9)	7 (1.6)	2 (0.5)	8 (1.8)	36 (8.2)

**Table 4.** Injury types according to diseases

Systemic/ Congenital Disease	Simple Dental Injuries		Severe Dental Injuries					Total
	Crown Fractures	Concussion	Int.	Ext.	Lateral Luxation	Subluxation	Avulsion	
Allergic diseases (Asthma etc.)	3	0	0	3	4	2	1	13
Hepatic Diseases	0	0	1	1	0	0	0	2
Cardiac Diseases	1	0	0	0	3	0	2	6
Attention deficit/ hyperactivity	3	0	0	0	0	0	0	3
Epilepsy	2	0	0	0	0	0	4	6
Anemia	4	0	0	0	0	0	1	5
Total	14	0	1	4	7	2	8	36

Looking at the files, it was observed that the children with serious trauma had respectively asthma, epilepsy and cardiac diseases. This is why, as much as possible, the etiological factors of trauma should be determined, and it should be aimed to take precautions.

While there are studies suggesting that, in addition to causing dental caries by affecting the oral microflora, drugs used in the asthma patient group may be effective in the trauma experiences of children by leading to hyperactivity, aggression, sleeplessness and concentration disorders, while these drugs also increase the severity of the trauma that is experienced, whereas there are also studies reporting no significant link (7-9).

Furthermore, according to the data of the 2000-2002 National Health Survey, children with chronic asthma or attention deficit/hyperactivity have a higher probability of exposure to traumatic injuries than healthy children (10).

In our study, too, the rate of severe dental injuries in the children with asthma was found higher than that of simple dental injuries.

Epilepsy is also considered in cases of patients who frequently arrive at clinics with crown fractures (11). In neurological diseases such as epilepsy, the quality of life of patients decreases due to recurring episodes in addition to psychiatric and cognitive disorders (12,13). It was reported that, in epilepsy patients, the risk of trauma is higher due to traumas that occur during an episode and the side effects of long-term antiepileptic drug use (14). It was stated that, in addition to the severity of an episode, the negative effects of other comorbid diseases and some antiepileptic drugs on the vitamin D metabolism also increase the severity of traumas (15). In our study 66.6% of the epilepsy patients had severe dental injuries.

Cardiac disease is also an important risk factor in experiencing trauma, and in the anamnesis of one of our patients, there was a history of passing out due to the disease.

It was reported that side effects such as delayed maturing of the central nervous system and psychomotor development may be seen in blood diseases developing in children of growing age (e.g. thalassemia, anemia) (16). As a result of the hyperplasia developing in the bone marrow of thalassemia patients, growth and development disorders are seen in the skeletal structure (17). With the growth of the maxilla, malocclusions such as protrusion, deep bite and open bite in upper teeth are observed (18). It is a known issue that, in the occlusion of the jaws, the excessive anterior positioning of the maxillary front teeth in comparison to the mandibular teeth increases the risk of trauma (19,20).

Attention deficit and hyperactivity, among the most frequently encountered neurobehavioral disorders in children, make children more prone to accidents and injuries by leading to abnormal motor activities. It was reported that reduced attention capacity causes sudden uncontrolled behaviors, and all these increase the risk of traumatic injuries (21, 22). In our sample, the ratio of attention deficit-hyperactivity in the children with trauma was found to be very low. In this study based on anamnesis, failure of the families to indicate this issue may have been the reason for this result .

## 5. Conclusion

Evaluation of systemic / congenital diseases and drugs related to these diseases related to permanent tooth trauma, these factors were observed to be effective in imaging trauma injuries in children but similarly high rates of injury in healthy children. However, it is for further study to review this topic with a clear conclusion.

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