

## INJURIES TO THE PRIMARY TEETH AND SOFT TISSUES IN CHILDREN IN NIŠ, SERBIA

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The aim of this study was to analyze injuries to the primary teeth and adjacent soft tissues in relation to the gender and age of injured children, type of injury, place, and mechanism of injury. The study enrolled 115 children (71 boys and 44 girls) managed at the Dentistry Clinic, Faculty of Medicine, University of Niš, in the period 2009-2019. The information about the type of injury, place, and mechanism of injury were obtained from the medical records of the patients aged 1-5 years. Our analysis established that there were statistically significantly ( $p < 0.05$ ) more injured boys (61.74%) than girls (38.26%). Subluxation was the most common primary teeth injury, present in 60 (52.17%) children and was statistically significantly more prevalent compared to other injuries ( $p < 0.001$ ). Of the injuries to the adjacent soft tissues, laceration was statistically significantly more common than other soft tissue injuries ( $p < 0.001$ ). Children were most commonly injured at their homes (52.17%), and rarely in their day nurseries (3.48%). Falling was the most common cause of injuries (63.48%). Based on the obtained results, a conclusion may be drawn that boys were more commonly injured compared to girls, and that falls were the most common cause. Injuries usually occurred at the age of about 2 years. Subluxation was the most common injury, and children usually got injured at their own home.

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**Key words:** primary teeth, injuries, subluxation, laceration

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### Introduction

The modern way of life has been increasingly exposing children to various injuries, so that injuries to the teeth and adjacent soft tissues are becoming more and more common. Any damage to the structure of dental tissues and their supporting

apparatus, in any degree, disturbs the function of mastication, cosmesis, and produces speech difficulties, which stresses the significance of the problem. Injuries to the primary teeth usually occur between the 3<sup>rd</sup> and 4<sup>th</sup> year of life (1-4). In that period of their development, children have a strong urge to explore their immediate environment, and because of their insufficiently developed motoric skills, inability to properly assess imminent dangerous situations, lack of control of the impulses, and unawareness of the consequences of their actions, they are more susceptible to various injuries. The causes of dental injuries at that age are diverse, and the most common are falls while running or playing, as well as collisions with various objects. In addition to teeth, soft tissues of the orofacial region may be injured as well.

Due to great elasticity of the bone and weakness of the periodontal ligament, injuries to periodontal tissues are much more common with primary teeth compared to permanent ones (3, 5). Avulsions of the primary teeth in children aged under 2 years are especially common – in that period the growth of the dental roots is not yet completed.

Since in pediatric populations traumas are mostly the consequence of falls or these are injuries acquired while playing, it is very difficult to prevent them. It is not at all uncommon that injuries to the

teeth are the reason for the child's first visit to the dentist (6). Injuries to the teeth and adjacent soft tissues are not only a physical and psychological trauma for the child, but for the parents as well. An adequate approach and treatment by the dentist is essential in such situations.

### The aim

Our aim in the paper was to analyze injuries to the primary teeth and adjacent soft tissues in relation to the gender and age, type, place, and mechanism of injury.

### Materials and methods

The information about the type, place, and mechanism of injury were obtained from the medical records of patients aged 1-5 years, therapeutically managed at the Dental Clinic in Niš in the period 2009-2019. The study involved 115 children (71 boys and 44 girls). We analyzed the type of tooth

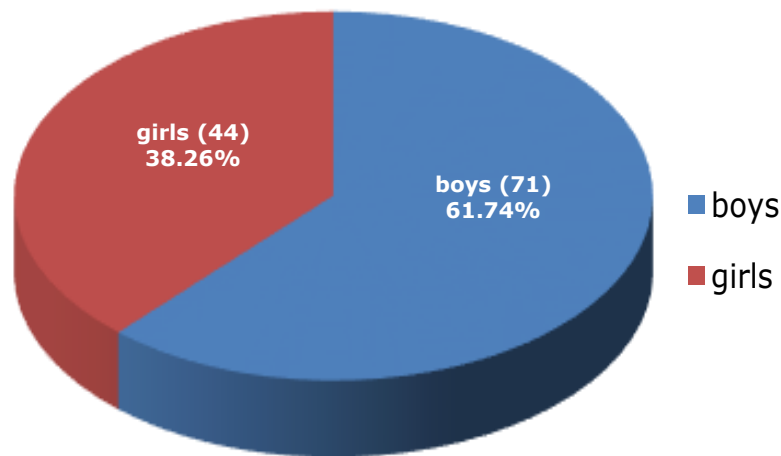
injury, gender and age distribution, as well as the cause and place where the injury occurred. Tooth injuries were classified according to the Andreasen and Andreasen classification (7), while injuries to the adjacent soft tissues were categorized as lacerations, contusions, abrasions and swellings.

The obtained data were statistically processed (Chi square test) and presented in tables.

The study was conducted according to the World Medical Association's Declaration of Helsinki and approved by the Ethical Committee of the Faculty of Medicine, University of Niš.

### Results

The study enrolled 115 children with diagnosed injuries to the primary teeth and adjacent soft tissues. The number of male children ( $n = 71$ ; 61.74%) was statistically significantly higher than that of female children ( $n = 44$ ; 38.26%) ( $p < 0.05$ ) (Graph 1).



**Graph 1.** Prevalence of injuries by gender

The sample was inhomogenous related to the place of occurrence of tooth injuries ( $p < 0.001$ ). Children most commonly got injured at their homes (60 examinees; 52.17%), and injuries in children day care institutions (kindergartens) were the rarest (4 examinees; 3.48%). As the place where children got injured, home was statistically more common compared to all other places individually ( $p < 0.001$ ). Girls statistically significantly more commonly got injured in the street than boys ( $p < 0.05$ ) (Table 1).

The sample was not uniform as to the mechanism of injury either ( $p < 0.001$ ). Children most commonly got injured by falling (73 examinees; 63.48%), which was statistically significantly more

common compared to injuries inflicted by punching and bicycle injuries each ( $p < 0.001$ ) (Table 2).

The most common periodontal soft tissue injury was laceration (31 children; 26.96%), being statistically significantly more common than abrasions or swellings each ( $p < 0.001$ ). Lacerations were most common in boys, and contusion was per a single examinee more common compared to laceration in girls. Contusions were statistically significantly more common in girls than in boys ( $p < 0.05$ ) (Table 3).

The most common injury to the primary teeth was subluxation (60 children; 52.17%), being more common than any other reported injury ( $p < 0.001$ ) (Table 4).

Since the prevalence of fractures was relatively low, their prevalence by the factor of class was low too. There were no statistically significant

differences in the prevalence of fracture classes between the studied groups (Table 5).

**Table 1.** Place of injury

Place of injury	Male gender		Female gender		Total	
	Count	Percentage	Count	Percentage	Count	Percentage
Home	39	54.93%	21	47.73%	60	52.17%
Backyard	17	23.94%	6	13.64%	23	20.00%
Park	7	9.86%	7	15.91%	14	12.17%
Street	5	7.04%	9	20.45% *	14	12.17%
Day care (kindergarten)	3	4.23%	1	2.27%	4	3.48%
Total	71	100.00%	44	100.00%	115	100.00%

\*p < 0.05

**Table 2.** Mechanism of injury

Mechanism of injury	Male gender		Female gender		Total	
	Count	Percentage	Count	Percentage	Count	Percentage
Bicycle	10	14.08%	10	22.73%	20	17.39%
Falling	47	66.20%	26	59.09%	73	63.48%
Punches	14	19.72%	8	18.18%	22	19.13%
Total	71	100.00%	44	100.00%	115	100.00%

**Table 3.** Types of injuries of periodontal soft tissues

Type of soft tissue injury	Male gender		Female gender		Total	
	Count	Percentage	Count	Percentage	Count	Percentage
Laceration	18	25.35%	13	29.55%	31	26.96%
Contusion	11	15.49%	14	31.82% *	25	21.74%
Abrasion	7	9.86%	1	2.27%	8	6.96%
Swelling	7	9.86%	4	9.09%	11	9.57%

\* p < 0.05

**Table 4.** Type of primary teeth injury

Type of primary teeth injury	Male gender		Female gender		Total	
	Count	Percentage	Count	Percentage	Count	Percentage
Subluxation	39	54.93%	21	47.73%	60	52.17%
Intrusion	18	25.35%	10	22.73%	28	24.35%
Extrusion	10	14.08%	7	15.91%	17	14.78%
Lateral luxation	11	15.49%	10	22.73%	21	18.26%
Avulsion	7	9.86%	8	18.18%	15	13.04%
Fracture	6	8.45%	4	9.09%	10	8.70%

**Table 5.** Injuries to the hard dental tissue and the pulp

Dg of primary teeth injury	Male gender		Female gender		Total	
Enamel fracture	2	2.82%	3	6.82%	5	4.35%
Uncomplicated crown fracture	2	2.82%	0	0.00%	2	1.74%
Complicated crown fracture	3	4.23%	1	2.27%	4	3.48%

## Discussion

Numerous studies worldwide have suggested that modern lifestyles lead to increasingly more common injuries to the orofacial region. Injuries to the primary teeth and adjacent soft tissue have got a prominent place among them (4, 8). This study analyzed a sample of children with injuries to the primary teeth and adjacent soft tissue who visited the Dentistry Clinic for that reason. However, we should bear in mind that the number of injured children is most probably higher, since the children with small-scale injuries probably have not visited any doctor at all. Moreover, primary teeth usually draw less attention than permanent teeth and consequences of injuries to the primary teeth are usually perceived as less serious. In view of the fact that many teeth injuries were managed outside the Dentistry Clinic in out-patient clinics and in privately owned clinics, it can be assumed that this study cannot be taken to account for the number of injuries in the studied period.

Numerous studies have shown that primary teeth injuries are more prevalent in boys (9-16). Our results were similar – 61.74% of the injured were male children. However, Carvalho et al., in 1998, have shown in their study that injuries to the primary teeth are more common in girls. This could be explained by the fact that boys and girls aged up to 5 years are equally exposed to the risk of injury, since their activities and games are similar to a point.

Analyzing the results for examinees in different age groups, it was established that injuries were rare in children under 1 year of age (only 0.87%), which agreed with the available literature data (17). In some studies it has been found that the prevalence of primary teeth injuries in children is highest in the period from 3 to 5 years of age (2, 15). In our study, these injuries most commonly occurred at the age of 2 years (30.43%). It is the period of onset of independent walking, making the risk of traumas rather high – although they start to walk independently, without support of others, their movement coordination is still inadequate.

This study showed that periodontal tissue injuries were much more frequent than injuries to hard dental tissues. Other authors have got similar results (3, 9, 18). Subluxation was the most common injury. Many authors have also indicated subluxation as the most common injury of the primary dentition (2, 4, 9, 18). The root of the primary teeth is shorter, with usually incomplete growth or with already started resorption, the crown is short and

chunky and it is harder to break it, so that injuries to the supporting dental tissues are more frequent. The reason for more common injuries to periodontal tissues in primary dentition is the number and distribution of periodontal fibers and greater elasticity of the alveolar bone.

Bearing in mind that injuries to the primary and permanent dentition occur in different places, with different mechanisms of injury, under the action of different forces and objects and that these differ among particular age groups, it can be said that the etiology of tooth injury is very complex and depend on a multitude of interactions of different factors and circumstances. Home is the predominant place where dental injuries occur (as high as 52.17%). Other authors have come to the similar results (3, 19-21). Male examinees were slightly more frequently injured at home. Children were rarely injured in kindergartens (3.48%), in contrast to the data presented by Skaare and Jacobsen, who reported a high rate of injuries in kindergartens (2, 22). Injuries were the consequence of insufficiently developed motoric abilities of children of that age. Other authors have come to the similar results (9, 13, 18, 23, 24).

Falling was the most common cause of injury (63.48% of cases) and slightly more in boys (66.20%) compared to girls (59.09%). There are certain differences among the studies as to the most common causes of dental traumas, although falling is still the predominant cause (9, 13, 18-21, 23).

The research of Eyuboglu et al. has shown that 50% of injuries to the primary teeth were associated with periodontal tissue injuries (25). The most common soft tissue injury was laceration (26.96%). Since lacerations are associated with visible bleeding, the parents were thus scared the most and were highly motivated to visit dentists on that account. This did not exclude the possibility that other soft tissue injuries were present in even higher proportions, but they simply passed unnoticed due to their much less dramatic clinical picture, so that parents thought it was not necessary to visit their dentists.

Since injuries occur in children from their earliest age, they represent a very difficult and unpleasant experience for both the injured children and their parents. These injuries can disturb the functions of mastication, speech and communication, and disrupt cosmesis of a child in the period of its most intense physical and psychological growth and development, which further stresses the significance of these injuries.

## Conclusion

Based on the obtained results, a conclusion may be drawn that:

- dental injuries in the primary dentition are more common in boys;
- dental injuries in the primary dentition are most common in the age of about 2 years;
- periodontal injuries are much more common than injuries to the hard dental tissue;
- lacerations are the most common soft tissue injuries;
- falls are the most common cause of dental injury in pediatric populations.

In childhood, teeth injuries are mostly the consequence of falls and playing, being thus very

difficult to prevent. Therefore, it is not uncommon that these injuries are the reason for the child's first visit to a dentist. These traumas do not represent just a disruption of physical tissue integrity – these are also psychological traumas for both the injured children and their parents. An adequate approach by the dentist is thus essential in circumstances such as these.

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doi:10.5633/amm.2021.0107**POVREDE MLEČNIH ZUBA I MEKIH TKIVA KOD DECE U NIŠU (SRBIJA)**

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Cilj rada bio je da se izvrši analiza povreda mlečnih zuba i okolnih mekih tkiva, u odnosu na pol i uzrast povređenih ispitanika, vrstu povrede i mesto i način povređivanja. Ispitivanjem je obuhvaćeno 115 dece (71 dečak i 44 devojčice), koja su zbrinuta na Klinici za stomatologiju Medicinskog fakulteta Univerziteta u Nišu, u periodu od 2009. do 2019. godine. Podaci o vrsti povrede i mestu i načinu povređivanja dobijeni su iz traumatoloških kartona bolesnika, uzrasta od 1 godine do 5 godina. Analizom je utvrđeno da je statistički značajno više ( $p < 0,05$ ) bilo povređenih dečaka (61,74%) nego devojčica (38,26%). Najčešća povreda mlečnih zuba je subluksacija, koja je prisutna kod 60 (52,17%) dece i statistički je značajno zastupljenija u odnosu na ostale povrede ( $p < 0,001$ ). Od povreda okolnih mekih tkiva, laceracija je statistički značajno zastupljenija od ostalih povreda mekih tkiva ( $p < 0,001$ ). Deca su se najčešće povređivala u kući (52,17%), a najređe u vrtiću (3,48%). Najčešći uzrok povrede je pad (63,48%). Na osnovu dobijenih rezultata može se zaključiti da su se dečaci više povređivali od devojčica i da je najčešći uzrok povrede pad. Povrede su se najčešće događale u uzrastu oko 2. godine života. Od svih povreda najzastupljenija je bila subluksacija, a deca su se najčešće povređivala u kući.

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**Ključne reči:** mlečni zubi, povrede, subluksacija, laceracija

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