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Research

Causes and Features of Childhood Trauma in COVID-19 Period

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ABSTRACT

Background: In this study, we aimed to reveal the characteristics and severities of child traumas under the Covid-19 pandemic and lockdown according to trauma mechanisms, locations and age distributions, and to evaluate the results.

Subjects and Method: The data of 333 pediatric trauma patients who came to our hospital during the lockdown period were analyzed retrospectively. The frequency and ratio analysis of the data obtained by the purposeful sampling method was performed. Pediatric Trauma Score, Injury Severity Score and Pediatric Glasgow Coma Scale were calculated. Gender, age distribution, trauma locations and trauma mechanisms were recorded, and distribution characteristics of the data according to trauma scores were compared. Continuous variables were analyzed using Student's t-test. Categorical variables were analyzed using the chi-square test. Statistical significance level was accepted as <0.05.

Results:193 of the patients (58.0%) were male. The mean age of the patients was 7.73 (Mean= 7.73; SD= 5.33). The most common trauma patients (49.8%) consisted of the school age patients. The number of patients who applied to our hospital from the urban was 244 (73.3%), and it was observed that the trauma occurred at homeside in 189 (56.8%) patients. The most common cause of trauma was falls. The mean Pediatric Trauma Score of the patients was 10.43 (Mean= 10.43; SD= 1.28), the Injury Severity Score was 2.24 (Mean= 2.24; SD= 4.45), the Pediatric Glasgow Coma Scale calculated was 14.95 (Mean= 14.95; SD= 0.66). It was observed that 99.7% of the study patients according to the Injury Severity Score and 93.7% according to the Pediatric Trauma Score were minor trauma.

Conclusion: Major childhood traumas and mortality decreased with the Covid 19 pandemic and lockdown.

Keywords: Childhood, Covid-19, Pediatric Trauma Score, Injury Severity Score, Pediatric Glascow Coma Scale

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BACKGROUND

Childhood traumas were still an important cause of mortality today (Haller, 1983; Cooper et al., 1992; Esposito et al., 1999; World Health Organization, 2014). Approximately 60 of every hundred thousand children in the world die due to trauma (World Health Organization, 2014).

The Covid-19 pandemic, which has affected the world, has affected every step of the society as well as the daily lives of their children. As a result of the measures taken due to the current epidemic, patients in the pediatric age group have the opportunity to evaluate trauma events when outside mobility was minimized. Especially in

our country, the change of child trauma cases in hospitals during the curfew period of citizens under 18 years of age applied between 4 April 2020 and 31 May 2020 was seen in daily working practice. It was seen in the studies in the literature that child traumas have decreased during the Covid-19 period(Keays, Friedman and Gagnon, 2020; Nabian et al., 2020).

In our study, we aimed to evaluate the results of this restriction in terms of child traumas and to reveal the characteristics and severities of traumas according to the mechanisms, locations and age distributions of the traumas in this period.

SUBJECTS AND METHOD

1. Study Design

The study was planned as a retrospective cross-sectional evaluation. The records of pediatric trauma patients who applied to the emergency department of Kastamonu Training and Research Hospital between April 4, 2020 and May 31, 2020 were evaluated.

2. Population and Sample

Pediatric trauma patients within the specified study dates with the purposeful sampling method were accepted as the study population. Child burn traumas were not included in the study because they were evaluated in a unit separate from the emergency service of our hospital.The data of all pediatric traumas between the specified dates were reached and the sample of the study was determined as 333 patients.

3. Study Variables

The independent variables were gender, age distribution, location of trauma and trauma mechanism. The dependent variables were Pediatric Trauma Score (PTS), Pediatric Glasgow Coma Scale (PGCS) values, Injury Severity Score (ISS), treatment methods, morbidity and mortality.

4. Operational Definition of Variables

Gender, age distribution, location of traumas and trauma mechanisms, treatment methods, morbidity and mortality information of patients were collected.

Patient data were reevaluated and Pediatric Trauma Score (PTS), Pediatric Glasgow Coma Scale (PGCS) values and Injury Severity Score (ISS) were calculated. PTS 8 and below scores, ISS 16 and above scores were considered major traumas (Tepas et al., 1987; Copes et al., 1988; Holmes et al., 2005).

Age distribution of patients were grouped for analysis as infant (0-2 years), preschool childhood (3-6 years), school age childhood (7-17 years).

5. Study Instruments

Patient information in the hospital automation system was collected and evaluated retrospectively. No other analysis or examination was performed the patients for the study.

6. Data Analysis

The data obtained from the patients' records were recorded in the SPSS version 20 (IBM) system. Frequency and ratio analyzes were made. Continuous variables were analyzed using Student's t-test. Categorical variables were analyzed using the chi-square test. Statistical significance level was accepted as <0.05.

7. Research Ethics

This study was conducted in accordance with the Declaration of Helsinki and was approved by the ethics committee (18 November 2020, 2020-BEUEK-2020/22).

RESULTS

1. Sample Characteristics

Of the 333 patients who applied to our hospital, 193 (58.0%) were male. The mean age of the patients was calculated as 7.73±5.33 years. The most common trauma patients (49.8%) consisted of the school age

childhood patients. The number of patients who applied to our hospital from urban was 244 (73.3%), and it was observed that the trauma occurred at homeside in 189 (56.8%) patients. The patient's demographic characteristics were shown in Table 1.

Table 1. Subjects characteristics

Characteristics	Category	Frequency	Percentage
Gender	Male	193	58.0%
	Female	140	42.0%
Location of Trauma	Homeside	189	56.8%
	Outside	144	43.2%
	Urban	244	73.3%
	Rural	89	26.7%
Age Distribution	Infant	62	18.6%
	Preschool Childhood	105	31.5%
	School Age Childhood	166	49.8%

It was observed that the most common cause of trauma was falling. The trauma mechanisms of the patients were shown in Table 2.

Table 2. Distribution of patients according to the mechanisms of trauma

Trauma Mechanisms	Frequency	Percentage
Fall	180	54.1%
Simple Extremity Injuries	84	25.2%
Tool Injury	38	11.4%
Traffic Accident	11	3.3%
Injury by Animal	10	3.0%
Assault	9	2.7%
Fire Gun Injury	1	0.3%
Total	333	100%

2. Bivariate Analysis

When only the fall cases were examined, 56.7% of them were fall traumas at homeside. Distribution of traumas by location of traumas and age groups were given as Figure 1-3.

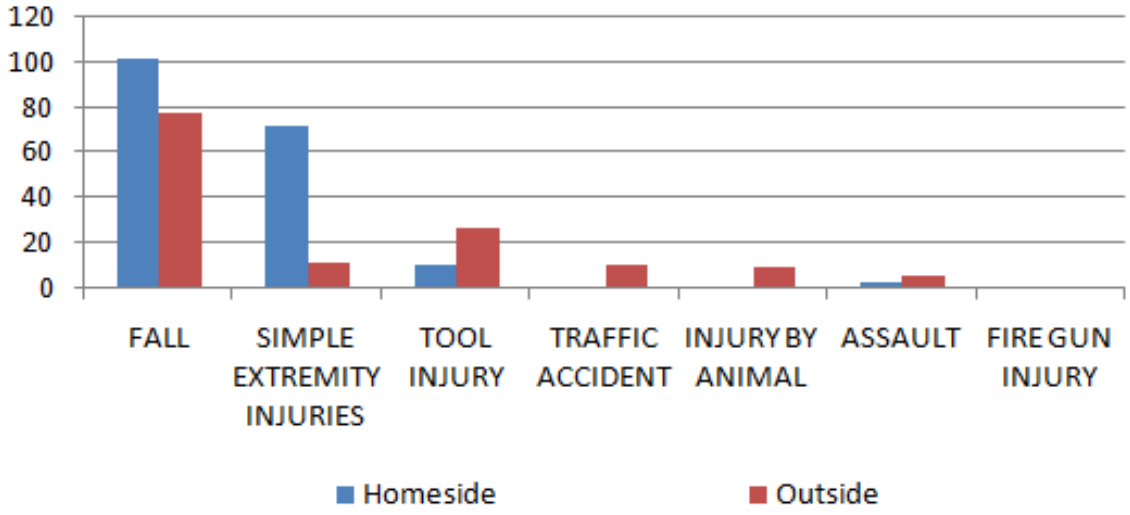

Figure 1. Cause of Trauma - Location of Trauma (Homeside Outside)

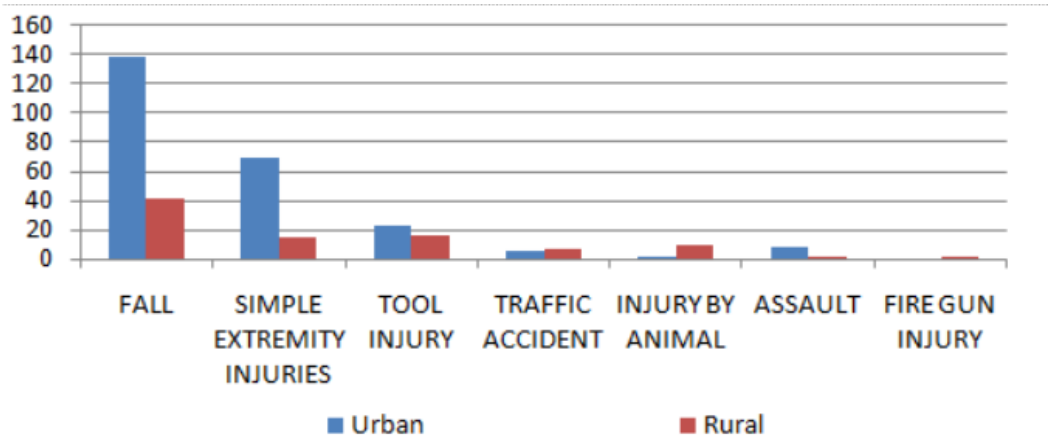

Figure 2. Trauma Cause - Trauma Location (Urban – Rural)

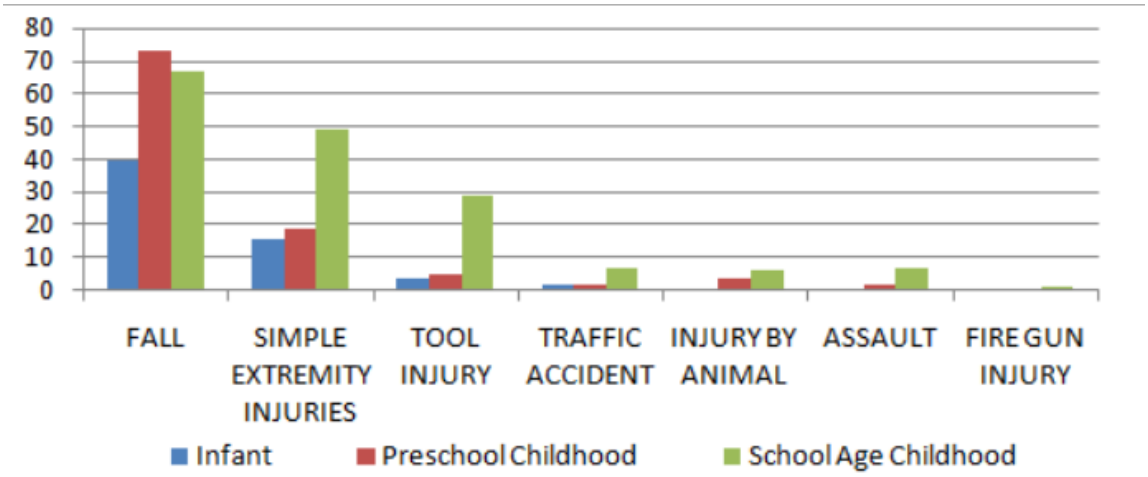

Figure 3. Cause of Trauma - Age Groups

The mean PTS of patients was calculated as 10.43±1.28, ISS 2.24±4.45,PGCS value was calculated as 14.95±0.66. Average trauma scores were evaluated according to the mechanisms of traumas and the distribution of scores to trauma mechanisms were given in Table 3. Of the patients, 99.7% according to the ISS score and 93.7% according to the PTS score were minor traumas. Major trauma rates by trauma mechanismswere shown in Table 4.

Table 3. Trauma scores distribution of trauma mechanisms

Trauma Mechanisms	ISS				PTS				GKS			
	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
Fall	2.16	1.86	0	9	10.34	1.10	6	12	14.98	0.10	14	15
Simple Extremity Injuries	1.22	1.46	0	10	10.79	1.12	5	12	15	0	15	15
Tool Injury	3.23	2.62	1	12	10.07	1.21	6	12	15	0	15	15
Traffic Accident	2.45	1.63	1	6	10.18	0.98	8	11	15	0	15	15
Injuryby Animal	2.30	2.58	1	9	11.00	0	11	11	15	0	15	15
Assault	1.00	1.32	0	4	11.33	2.58	10	12	15	0	15	15
Fire Gun Injury	75.00	-	75	75	-1	-	-1	-1	3	-	3	3

Table 4. Major trauma rates by trauma mechanisms

Trauma Mechanisms	Major Traumas for PTS	
	Frequency	Percentage
Fall	14	66.7%
Simple Extremity Injuries	3	14.3%
Tool Injury	2	9.5%
Traffic Accident	1	4.75%
Injury by Animal	0	0%
Assault	0	0%
Fire Gun Injury	1	4.75%
Total	21	100%

When average trauma scores were evaluated according to descriptive data, ISS of patients from rural were statistically significant high and PGCS scores were statistically low. Trauma scores comparison of trauma locations were given in Table 5.It was found that outside cases were statistically significantly more minor injuries than homeside trauma cases.

Table 5. Trauma scores comparison of trauma locations

Trauma Locations	ISS			PTS			PGCS		
	Mean	SD	p	Mean	SD	p	Mean	SD	p
Homeside	2.28	5.69	0.162	10.37	1.52	0.004	14,92	0.87	0.044
Outside	2.20	1.86		10.51	0.88		15	0	
Urban	1.86	1.83	0/003	10.48	1.16	0.377	14.99	0.09	0.002
Rural	3.30	8.00		10.29	1.56		14.86	1.27	

In the assessment by age groups, PTS was statistically significantly lower in the infancy age group compared to the other two groups ($p<0.001$). There were no statistical differences in ISS and PGCS by age groups. According to the ISS, 1 patient with major trauma was in the school-age childhood age group, while 18 (85.7%) of the 21 patients with major trauma were in the infant age group, according to the PTS.

During the study, the mortality rate was 0.3% and the morbidity rate was 2.4%. No comparison was made, as the mortality and morbidity numbers were not sufficient for statistical comparison.

DISCUSSION

Childhood traumas still remain an important cause of mortality in developed and developing countries (Serinken and Özen, 2011; Mansuri et al., 2020). In America, the most common cause of death in patients under the age of 14 was death due to trauma (Tracy et al., 2013). Approximately nine million children were treated in hospitals for injuries per year. These injuries result in approximately 7000 deaths (Serinken and Özen, 2011; Tracy et al., 2013; World Health Organization, 2014).

Among these data, one of the most common causes of trauma that leads to death in the world and in our country was traffic accidents (Serinken et al., 2011). Within the limitations, the number of patients injured due to traffic accidents was 3.3% in our study, and it was similar to 4.52% in the series In which all major and minor trauma patients admitted to the emergency room by Tambay et al(Tambay et al., 2013). In Tambay's study, the most common cause of death was traffic accident, which accounts for about half of all deaths. A study conducted by Serinken and Özen in 2011 also showed that 3.9% of traffic accidents resulted in mortality, and the highest form of mortality was non-

vehicle traffic accidents, which accounted for 59.4% of all deaths in the study.In our study, there were no deaths due to traffic accidents (Serinken and Özen, 2011). Considering the traffic accident rate of up to 20-50% in the major trauma series made from different centers in 1998 and 2020 in our country, it can be said that the major trauma caused by the traffic accident, which was zero according to the ISS of 9% according to the PTS in our series, was completely prevented due to restrictions (Gurses et al., 2002; Atik et al., 2020).

Injuries caused by falls were observed in the literature of our country at rates close to 30-40% (Güzel, Karasalihoğlu and Küçükuğurluoğlu, 2007; Korkmaz et al., 2014). In our study, this rate increased to 55%. This rate was thought to occur as a result of the reduction in outside traumas. However, in order to compare the fall incidents in detail, the height that has been dropped must be specified. In the study we prepared, falls from the same level, falls from a low level such as a sofa bed, and falls from a higher level such as a balcony tree slide were evaluated under one heading. The reason for this assessment was that all fall cases encountered during the study period were minor injuries according to the ISS. In a study conducted by Bulut and friends, 32% patients of fall had a ISS above 16 in, while in our study, this ratio was none (Bulut et al., 2002). In another study, 35% of falls patients had a PTS value of less than 8., while in our study, this ratio was only 7.8% (Kılıç et al., 2016).

Another feature evaluated in our study was whether the place of residence of the patients was a urban or not. In this distinction caused by the functioning of our health system, patients in the urban applied directly to our hospital, while patients rural were primarily evaluated in another hospital, and some of the minor trauma patients were monitored and treated in these hospitals. In accordance with the result of this application, the ISS scores of the patients coming to our hospital from rural were statistically significantly higher. Since this assessment was not encountered in the publications, no comments could be made to support or exclude our opinion except for our own data.

It was observed that the majority of the traumas during the curfew period were traumas experienced in the home as expected. In addition, even during this period, outside injuries accounted for 46% of our study. When we looked at the data in the literature, it was seen that the rate of outside trauma decreased during this period (Tambay et al., 2013; Korkmaz et al., 2014).

The pediatric trauma scores of the patients were found to be statistically significantly higher, whisch we think was due to the fact that the children who went outside were older and had more limited mobility due to the limitations during the working period. The number of 18% patients in infancy was found to be in line with approximately 20% data in the literature (Tambay et al., 2013). In PTS, which also takes body weight as a parameter, the scores of the cases in the infancy group were significantly lower than the other age groups. Similar statistical significance was not obtained for ISS and PGCS. There was a major trauma group with 0.3% according to PTS and 6.3% according to ISS. A proportional difference was observed between the two score systems. The difference between the two scoring systems showing correlation in the literature was due to the fact that the mortality in our study was only 1 patient (Tepas et al., 1987; Yousefzadeh-Chabok et al., 2016). Among both scoring systems, this patient was in the major trauma group and was the only patient in the major trauma group for ISS.

As a result, childhood traumas were encountered in every period and condition. With curfew restriction, major childhood traumas and mortality decreased. Similar comparative studies were needed to support this result and to put it more accurately.

CONFLICT OF INTEREST

The authors have no conflict of interest in the study. No support was received from any person, institution, or organization for the study.

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