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THE IMPACT OF THE COVID-19 LOCKDOWN ON THE SEVERITY OF PEDIATRIC TRAUMAS

COVID-19 SOKAĞA ÇIKMA YASAĞININ ÇOCUK TRAVMALARININ ŞİDDETİ ÜZERİNDEKİ ETKİSİ

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ABSTRACT

Aim: We aimed to evaluate the results of COVID-19 lockdown in terms of child traumas and to reveal the change in the characteristics and severity of traumas by comparing the lockdown period with the same period one year ago.

Material and Method: The records of pediatric trauma patients were assessed retrospectively. The data of all pediatric traumas between the specified dates were reached and the sample of the study was determined as 1970 patients. Descriptive characteristics of patients and trauma events were determined. Patient data were re-assessed, and Pediatric Trauma Scores, and Pediatric Glasgow Coma Scale values, and Injury Severity Scores were calculated.

Results: Of the patients, 1637 (83.1%) had admitted before the lockdown and 333 admitted during the lockdown period. It was found that the school-age children constituted the group with the most prevalent trauma patients in both periods with a rate of 76.2% before the lockdown and 49.8% in the lockdown period. It was found that the measure of lockdown reduced the rate of outdoor trauma cases from 63.2% to 43.2% ($p<0.001$). Whereas a statistically significant decrease was determined in the mean scores of the Pediatric Trauma Score and the Pediatric Glasgow Coma Scale, no difference was determined in the Injury Severity Score.

Conclusion: It is seen that the COVID-19 pandemic and its restrictions, which change our normal life in every aspect, also have effects on pediatric traumas. It is noticed atthis study that not only the number of traumas but also the severe traumas and mortality decreased during the lockdown.

Keywords: Trauma, Pediatric Trauma Score, Pediatric Glasgow Coma Scale, Injury Severity Score, COVID-19

ÖZET

Amaç: COVID-19 karantinasının sonuçlarını çocuk travmaları açısından değerlendirmeyi ve bir yıl önceki aynı dönemile karantina dönemini karşılaştırarak travmaların nitelik ve şiddetindeki değişimi ortaya koymayı amaçladık.

Gereç ve Yöntem: Çocuk travma hastalarının kayıtları geriye dönük olarak incelendi. Belirtilen tarihler arasındaki tüm pediatric travmaların verilerine ulaşıldı ve çalışmanın örneklemi 1970 hasta olarak hesaplandı. Hastaların tanımlayıcı özellikleri ve travma olayları belirlendi. Hasta verileri yeniden değerlendirilerek Pediatrik Travma Skorları, Pediatrik Glasgow Koma Skalası değerleri ve Yaralanma Şiddet Skorları hesaplandı.

Bulgular: Hastaların 1637'si (%83,1) karantinadan önce, 333'ü karantina döneminde başvurmuştu. Okul çağındaki çocukların, karantina öncesi %76,2 ve karantina döneminde %49,8 oran ıile her iki dönemde de en sık travma hastası olan grubu oluşturduğu tespit edildi. Karantina önlemlerinin açık hava travma vakalarının oranını %63,2'den %43,2'ye düşürdüğü bulundu ($p<0,001$). Pediatrik Travma Skoru ve Pediatrik Glasgow Koma Ölçeği puan ortalamalarında istatistiksel olarak anlamlı düşüş saptanırken, Yaralanma Şiddet Skoru'nda fark saptanmadı.

Sonuç: Normal yaşamımızı her yönüyle değiştiren COVID-19 pandemisi ve kısıtlamalarının pediatric travmalar üzerinde de etkileri olduğu görülmektedir. Karantina sayesinde sadece travma sayılarının değil, ağır travmaların ve mortalitenin de azaldığı bu çalışmada fark edildi.

Anahtar kelimeler: Travma, Pediatrik Travma Skoru, Pediatrik Glasgow Koma Ölçeği, Yaralanma Şiddet Skoru, COVID-19

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INTRODUCTION

The lockdown due to the COVID-19 pandemic was started and has been effective in our country since March 2020. It has many social and individual effects 1. It is important to reveal these effects to grasp what can happen if long-term restrictions are enforced again.

The publications in the literature report a decrease in the number of pediatric traumas 2-4. In the period before COVID-19, nearly 60 of every hundred thousand children in the world are lost due to trauma. Albeit these numbers are declining day by day due to the advances in technology, increasing public health opportunities, and security measures 5. In order to reveal the impact of the COVID-19 pandemic on pediatric trauma patients more accurately, it is necessary to assess the severity and consequences of trauma 6-8. Pediatric Trauma Score (PTS), Pediatric Glasgow Coma Scale (PGCS) value, and Injury Severity Score (ISS), are among the most frequently used, in various studies to reveal the severity of pediatric trauma 6-10. In our study, we aimed to evaluate the results of lockdown in terms of child traumas and to reveal the change in the characteristics and severity of traumas by comparing this period to the previous year.

MATERIAL AND METHODS

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 2019-May 2019 pre-lockdown period, and April 2020-May 2020 lockdown period were assessed retrospectively.

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 1970 patients.

Study Variables

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

Operational Definition of Variables

Gender, age distribution, location of trauma and trauma mechanism, treatment method, 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 6-8. Age distribution of patients were grouped for analysis as infant (0-2 years), preschool childhood (3-6 years), school age childhood (7-17 years).

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.

Research Ethics

This study was conducted in accordance with the Declaration of Helsinki and was approved by the ethics committee (14 December 2020, 2020-KAEK-143-08.01)

Data Analysis

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

RESULTS

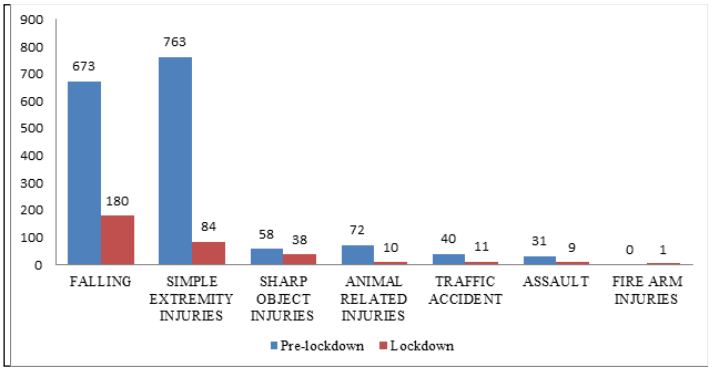
Among all patients, 1637 (83.1%) had admitted before the lockdown and 333 admitted during the lockdown period. The mean age was 9.86±4.82 years. It was determined that the school-age children constituted the group with the most common trauma patients in both periods with a rate of 76.2% before the lockdown and 49.8% in the lockdown period. The measure of lockdown caused a decrease in the rate of outdoor trauma cases from 63.2% to 43.2% (p<0.001). While the number of patients admitted to the hospital from the provincial center during the lockdown period was 244, it was 1313 in the period without lockdown enforcement (p=0.005). (Table 1)

Table 1. Descriptive data of the pediatric trauma patients at the pre-lockdown and lockdown period

	Pre-lockdown April-May 2019	Lockdown April-May 2020	Total	p(X^2)
	n (%)	n (%)	n (%)	
	1637(100)	333(100)	1970(100)	
Sex				
Male	963 (58.8)	193(58.0)	1156 (58.7)	0.769
Female	674 (41.2)	140 (42.0)	814 (41.3)	
Location of Trauma				
Homeside	602 (36.8)	189 (56.8)	791 (40.2)	**<0.001**
Outside	1035 (63.2)	144 (43.2)	1179 (59.8)	
Urban	1313 (80.2)	244 (73.3)	1557 (79.0)	**0.005**
Rural	324 (19.8)	89 (26.7)	413 (21.0)	
Age distribution				
Infancy	94 (5.7)	62 (18.6)	156 (7.9)	
Preschool Childhood	296 (18.1)	105 (31.6)	401 (20.4)	**<0.001**
School Age Childhood	1247 (76.2)	166 (49.8)	1413 (71.7)	

Pearson's Chi Square

It was determined that whereas simple extremity injuries were the most common type of trauma, and traumas due to falling were the second most common in the pre-lockdown period, this ranking reversed during the lockdown period. (Figure 1)



Upon the assessment, it was calculated that the distribution according to the mechanisms of trauma also differed statistically (p<0.001).

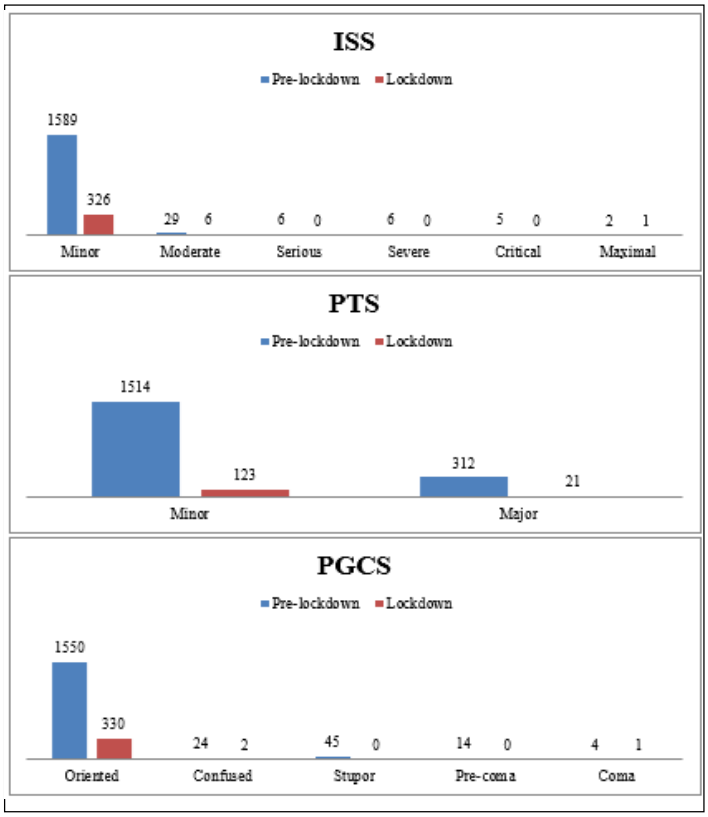
The mean hospital stay of the patients was calculated as 1.34±1.42 days. The mean length of stay in the hospitalwas 1.15±0.76 days in the lockdown period and shorter than the 1.38±1.51 days in the pre-lockdown period (p=0.007).

When the mean values of the PTS, ISS, and PGCS were compared, it was detected that the PTS and PGCS values were lower in the pre-lockdown period, whereas the ISS was higher. Whereas a statistically significant decrease was determined in the mean scores of the PTS and the PGCS, no difference was determined in the ISS (Table 2).

	Pre-lockdown		Lockdown		*p* (t-test)
	X	Standard Deviation	X	Standard Deviation	
PTS	10.15	1.41	10.43	1.28	**0.001**
ISS	2.45	5.27	2.24	4.45	0.453
PGCS	14.77	1.18	14.95	0.66	**0.007**

Student's T Test

The groups with the highest scores in all patients and both periods according to the three trauma assessment scores were minor trauma groups (Figure 2).



In the study, in which a total of 3.9% of the patients required surgical treatment, it was determined that the surgical intervention rate, which was 4.0% (n=65) before the lockdown, decreased to 3.6% (n=12) during the lockdown period. Moreover, the overall mortality was 0.8% (n=13), while it was 0.3% (n=1) during the lockdown period, and 1.2% in the pre-lockdown period. Thirty-five (81.4%) of 43 patients who developed permanent sequelae due to trauma, occurred in the pre-lockdown period. Proportionally, patients with sequelae were 2.4% in the lockdown period and 2.1% in the pre-lockdown period. Although changes occurred in the rates, no significant difference was determined between the two periods in terms of surgical requirement, sequelae, and mortality.

DISCUSSION

COVID-19 has impacted every aspect of life and continues to impact. We tried to reveal the effects of COVID-19, which we consider will need many studies to assess its effects after it is completely controlled with its protective and therapeutic methods and its restrictions on pediatric trauma in the light of scientific facts and methods. We are well-aware of the fact that the trauma severity ratings were made subsequently and results of patients who were referred to other centers possibly in need of specific surgery or advanced intensive care were not included in the study, which constitutes the limitations and weaknesses of our study, might have a certain impact on our results.

Our results, regarding gender and age characteristics, show similar characteristics with previous studies conducted in our country, and it has been determined that the lockdown does not make a difference in terms of gender 11,12. However, it is noticed that the ratio of school children during the ockdown period in the study decreased compared to the pre-lockdown period. This age group accounts for 70% of childhood traumas in the study of Tambay et al., and this is in line with our pre-lockdown period value 11. The fact that 50% of the traumas in the lockdown period consist of children in this age group indicates that the restrictions have reduced these children from being victims of trauma. Regarding the lockdown period, it was found out that the proportional increase in the traumas of infants and preschool children was mainly due to the significant decrease in the number of traumas during the school child period.

The decrease, which was around 50% in the study of Nabian et al. that examined the effects of the similar COVID-19 lockdown period for pediatric traumas by evaluating only the traumas caused by fractures, was found to be 80% in our study 2. We consider that this difference is due to the high number of minor trauma patients in the pre-lockdown period in our study, while patients without fractures were not included in the study of Nabian et al. 2. Supporting this idea, in the study of Keays et al. 4, which assessed all pediatric injuries, a 70% decrease was determined in the number of patients, which is in line with our result.

In the pre-lockdown period, simple extremity injuries seem to be the most common cause of trauma in accordance with the data revealed in our country 11. However, it is seen that the incidence of these traumas decreased by 90% during the lockdown period. The reasons for this are thought to be due to the fact that patients staying in the house because of the lockdown have not actually experienced such injuries, as well as patients with some simple extremity injuries, have not admitted to the hospital, given that a greater reduction occurred in them compared to the total reduction.

Upon reviewing the literature, it was determined that there is no study assessing and demonstrating the impact of lockdown on trauma severity. However, we adopt the idea that it is necessary to categorize these traumas with accepted standards to comment on trauma, otherwise the evaluations to be made would be incomplete. In addition to the decrease in the numbers and rates of the incidents, it seems that the severity of the trauma decreased significantly during the lockdown period as well. It can be inferred from this that the impact of lockdown appears not only as a numerical decrease but also as a reduction in the outcomes of traumas.

The mortality and morbidity rates, which are around 1-8% in our country and world data, include the rates of 0.8% and 2.1%, which accounts for our data in the pre-lockdown period 11-14. However, our lockdown period mortality rate is 0.3%, which is the lowest rate among the studies performed in our country 13,14. Except for this unfortunate, perhaps preventable, case encountered after a firearm accident at home, we have no mortality during the lockdown period. This situation made us think that mortality can be eliminated in pediatric trauma patients with the measures taken in the COVID-19 lockdown, though we are aware that it seems unrealistic. On the other hand, our morbidity rate increased by 2.4% during the lockdown period compared to 2.1% in the pre-lockdown period. When the cases with sequelae in the lockdown period were re-examined due to this result, which was inconsistent with the expectations, it was found that 4 patients with simple extremity injuries were exposed to complications following extremity fractures and permanent sequelae due to late admission to the hospital. It was found out that this increase was caused by the late admission to the hospital due to the lockdown period in some cases that are not vital but require treatment.

CONCLUSION

It is seen that the COVID-19 pandemic and its restrictions, which change our normal life in every aspect, also have effects on pediatric traumas. It is noticed from our study that thanks to the lockdown, not only the number of traumas but also the severe traumas and mortality decreased. In order to reveal the effect of restriction more accurately, it is necessary to make evaluations with more variables and the number of patients.

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