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An evaluation of orthopaedic trauma patients presenting at the emergency department during lockdown in the COVID-19 pandemic

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ABSTRACT

Aim: The SARS-CoV-2 virus causing COVID-19 disease, which started in Wuhan, China, in December 2019, rapidly affected the whole world and many precautions were taken in Turkey, as in other countries. The first case was recorded in Turkey on 11 March 2020, and the first COVID-19-related death on 15 March 2020. From that date, precautions were taken to prevent the spread of the disease, including the implementation of lockdowns and curfews. Although it was aimed to slow down public life during this period, orthopaedics and traumatology departments continued to function actively. The aim of this study was to evaluate orthopaedics and traumatology patients who presented at the Emergency Department (ED) during this period of lockdown.

Material and Method: The study included orthopaedic and traumatology patients who presented at the ED of Samsun Ondokuz Mayis University between 16 March and 1 June 2020, when there was a general lockdown. The data of these patients were retrospectively examined and were compared with the same period in 2019.

Results: During the specified period of the pandemic, 82 orthopaedics and traumatology patients presented at the ED, and in 2019, 109 patients presented. No statistically significant difference was found between the two groups in respect of age, gender, and the need for surgical procedure ($p > 0.05$). Although there was no statistically significant difference in age distribution, there was a decrease in the number of patients in the children age group during the pandemic period. No significant difference was found between the two groups in respect of the mechanism of injury, with the most frequent being a fall from a height of <1m and the least common was firearms injury.

Conclusion: Although there were small differences between the two periods examined in respect of the mechanism of injury of orthopaedic and traumatology patients, there was no significant difference. Therefore, in a pandemic period, treatment plans should be reviewed by taking appropriate precautions and establishing new algorithms.

Keywords: COVID-19, trauma, ethiology, lockdown

INTRODUCTION

The SARS-CoV-2 virus causing the novel coronavirus disease, COVID-19, within a short time rapidly spread, affecting the whole world (1,2). This outbreak was declared a global pandemic by the World Health Organization (WHO) in March 2020. Preventative measures were implemented to prevent the spread of diseases, such as moving education online, and sports and social activities were halted. Within the framework of these restrictions, lockdowns were implemented on some days in Turkey. However, as there remained a need for medical services even on the days when there was a lockdown, emergency medical services continued during this period. The orthopaedics and traumatology department is the leading department of those providing emergency services during this period. Trauma entails increased economic loss and morbidity for patients, and has become a major public health problem, which can be prevented (3,4). The WHO predicted that trauma would be the third leading cause of mortality worldwide in 2020 (5). Changes in the causes of bone

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fractures have emerged because of sociological changes in lifestyle during COVID-19 pandemic. Examining the epidemiology of fractures occurring as a result of trauma and taking precautions to prevent accidents causing fractures is known to be one of the most effective public health methods (6).

The hypothesis of this study was that there would be fewer patients presenting at the ED because of trauma during the lockdown period. The aim of the study was to determine the fracture characteristics of patients who presented at ED and were referred to the Orthopaedics and Traumatology Department of our centre during the lockdown period of the COVID-19 pandemic, and to thereby reduce the number of new fractures which may occur by increasing the precautions against the causes of fractures frequently seen during this period, and to show how the COVID-19 pandemic affected the orthopaedic and traumatology emergency procedures (7,8).

MATERIAL AND METHOD

The study was approved by Ondokuz Mayıs University Clinical Researchs Ethics Committee (Date: 23.07.2020, Decision Number: 506). In this retrospective study, all procedures and practices are in accordance with the ethical standards of the national/ institutional research committee and the 1964 Helsinki Declaration.

From the beginning of the COVID-19 pandemic, lockdowns were implemented at weekends in 31 provinces of Turkey, and were then gradually reduced within the plan for normalisation of life. The study included patients who presented at ED and needed orthpaedic consultation in the period of weekend curfews between 16 March 2020 and 1 June 2020. The data of these patients were retrospectively examined and then compared with data from the same period in 2019.

The data collected included demographic characteristics (age, gender), mechanism of injury, side and localisation of fracture, open or closed fracture, and fracture treatment model (conservative or surgery). The patients were separated into two groups as those who presented during the COVID-19 pandemic and those from the corresponding period in 2019. The mechanisms of injury were grouped as agricultural injury, traffic accident, fall at the same level (from <1m), fall from height (>1m), and others. Patients were excluded from the study if there was no fracture resulting from the trauma or if other systems were involved. The number of admissions was also evaluated by dividing the patients into 4 subgroups according to age: children (≤14 years old), young adults (15-44 years old), middle-aged adults (45-64 years old) and elderly patients (65 years and older).

Data obtained in the study were analyzed statistically using the Statistical Package for Social Sciences (SPSS) version 22.0 (IBM SPSS Corp., Armonk, NY, USA). The conformity of the in-group and inter-group variables to the normal distribution was examined using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). Independent two-sample t-test was used to compare two independent groups with normal distribution, and Mann Whitney U test was used to compare two groups that were not normally distributed. A p value of < 0.05 was considered statistically significant.

RESULTS

A total of 82 orthopaedic and traumatology patients presented at our hospital during the specified period of the pandemic (16 March 2020- 1 June 2020 when lockdowns were implemented). This group comprised 50 (61%) males and 32 (39%) females. In the corresponding period in 2019, 109 patients presented, comprising 77 (70.6%) males and 32 (29.4%) females (**Table 1**). No significant difference was determined between the two groups of patients in respect of gender distribution (p=0.150).

Table 1. The epidemiological characteristics of the patients and the treatment applied to present at the Emergency Department for orthopedic injuries

	2019 n=109	2020 (Pandemic period) n=82	p value
Gender (Male/Female)	77/32 70.6%/29.4%	50/32 61%/39%	0.150
Age, (mean/median) (years), (min-max)	33.04/24.5 (4 months-92 years)	38.41/37.5 (1 day-86 years)	0.297
Treatment			0.169
Surgical treatment, n (%)	36 (33.1%)	34 (41.5%)	
Conservative treatment, n(%)	73 (66.9%)	48 (58.5%)	

The mean age of the patients was 38.41 years (range, 1 day-86 years) during the pandemic, and 33 years (range, 4 months-92 years) in 2019. No significant difference was determined between the two groups in respect of mean age (Table 1) (p=0.297). The patients were divided into 4 subgroups: children (≤14 years), young adults (15–44 years), middle-aged adults (45–64 years) and elderly patients (65 years and over). For both periods, patients in the children age group constituted the majority. But, the number of the patients in the children age group was determined to have reduced during the pandemic (**Figure 1**).

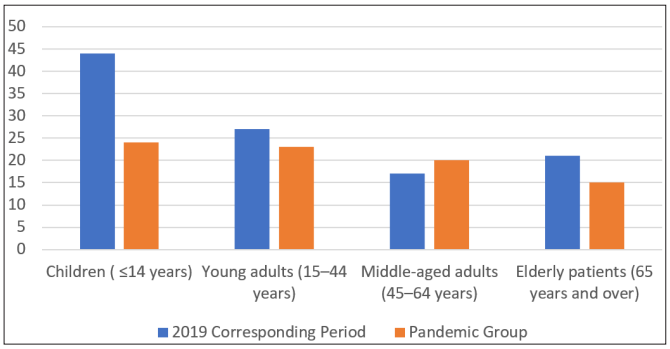

Figure 1. Age distributions of the patients

For the pandemic group, the proportion of fall from <1m height causing fractures was 53.6% (44/82), followed by minor trauma (11, 13.4%), traffic accident (8, 9.8%), fall from >1m height (7, 8.5%), soft tissue infection (6, 7.3%), agricultural injury (5, 6.2%) and firearms injury (1, 1.2%) (**Figure 2**).

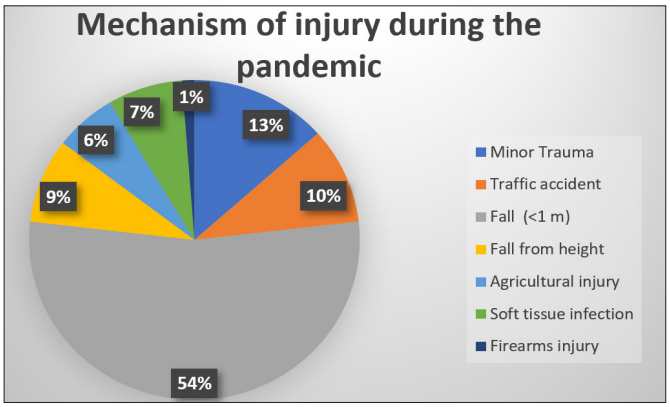

Figure 2. Distribution of patients according to the injury mechanism (Pandemic period)

For the patients presenting during the corresponding period in 2019, the proportion of fall from <1m height causing fractures was 48.6% (53/109), followed by minor trauma (18, 16.6%), traffic accident (14, 12.8%), fall from >1m height (7, 6.4%), agricultural injury (7, 6.4%), soft tissue infection (6, 5.6%) and firearms injury (4, 3.6%) (**Figure 3**).

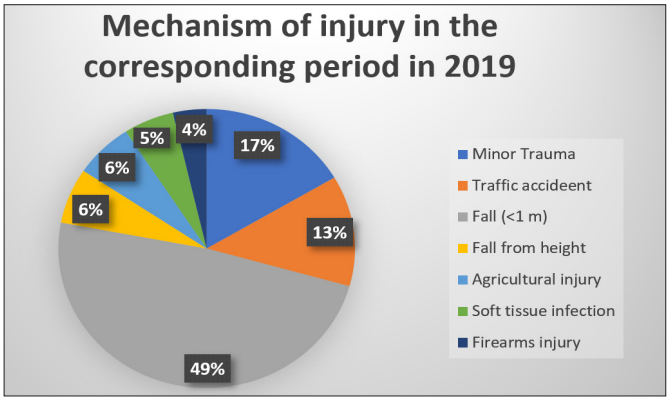

Figure 3. Distribution of patients according to the injury mechanism in 2019

Of the patients presenting during the pandemic, 48 (58.5%) could be followed up conservatively, and 34 (41.5%) had fractures that required surgery. Of the patients presenting in 2019, 73 (66.9%) were followed up conservatively, and 36 (33.1%) had a fracture pattern that required surgery. No statistically significant difference was found between the two groups in respect of the treatment methods (**Table 1**) (p=0.169).

DISCUSSION

Societal restrictions and lockdown during the coronavirus (COVID-19) pandemic have had a significant impact on the volume and nature of trauma admissions (9-11). Following the outbreak of COVID-19, precautions were taken in Turkey, just as throughout the world, to restrict the movement of people and reduce contact. The first case was recorded in Turkey on 11 March 2020, and then various restrictions were brought into force between 16 March and 1 June 2020 in the large cities throughout the country. One of the precautions was weekend lockdown. In this study, the effect of the lockdown was evaluated on the epidemiological characteristics of orthopaedic and traumatology patients who presented at ED.

The results of the study showed a decrease in the number of patients, but the differance was not statistically significant compared to the same period of the previous year. This decrease was thought to be due to patients being reluctant to go to the hospital for fear of contracting COVID-19 after a minor trauma.

When trauma centers around the world were examined during the pandemic, in Midland, New Zealand, there was seen to be a 43% reduction in patients presenting during a period of restrictions compared to pre-pandemic times. In that study, there was also observed to be a significant decrease in the Injury Severity Score values and a significant decrease in the numbers of traffic accidents and falls (12). Kamin et al. (10) examined ED cases in the lockdown period of February- April 2020, and found 80.5% decrease in motor vehicle accidents. In the current study, no significant difference was found between the two time periods in respect of motor vehicle accidents. A decrease in trauma cases associated with pandemics in the world has been previously reported. During the SARS pandemic in 2003, a trauma center in Taiwan reported a similar decrease in patients (13). In a single-centre, retrospective study conducted in Holland during the first COVID-19 lockdown (11 March-10 May 2020), which evaluated trauma patients presenting at ED, cases were observed to have decreased compared to 2019 and 2018 (14). In the same study, a significant decrease was found in sports injuries compared to the other periods. It was concluded that especially patients with minor trauma were reluctant to go to hospital because of concerns about the pandemic (14).

In the comparisons of the two groups in the current study, while there was no significant difference between the groups in respect of the mean age of the patients, when the age distribution was examined, there was seen to be a decrease in the children age group and an increase in the middle-aged adult group. The reason for the decrease in paediatric cases can be assumed to be that as a result of the lockdown, children were less active at home and less exposed to trauma. Similar results can be seen in literature (15-17). According to the results of a study by Susan et al. (18) in a level 1 trauma center, there was a significant decrease in the overall number of trauma-related admissions during the COVID-19 pandemic and especially during the lockdown period. Those results reflected a decrease in falls and traffic accidents. Another criteria investigated showed no significant increase in cases of self-harm and assaults. In the current study, the rate of self-harm injuries was not known.

The most common reason for presentation at ED in the current study was fall from the same level (<1m). Hip fractures as a result of falls within the home are often seen in the elderly population (19, 20). Hip fractures in the elderly patients, which are often observed in orthopaedics and traumatology practice, are treated with surgical methods. When these fractures occurring during the COVID-19 pandemic were compared with the control group, the rates were observed to be similar. The increased time spent in the home during the pandemic explains the similar rates of hip fractures resulting from a fall within the home. Bülent Güngörer found in his study that age is an independent risk factor in predicting the admission to intensive care unit of patients admitted to the emergency department with the diagnosis of COVID-19 (21). It should be kept in mind that preventive measures can be taken in the period of COVID-19 for this group, since it was determined in our study that there was no decrease in the number of elderly patients that presented at the emergency department.

A limitation of this study was the low number of patients. When it was assumed that there would only be emergency presentations at hospitals during the lockdown period, the study was designed using patients in a specific time interval. Despite this limitation, the study results provide information about the patient profile of those presenting at ED during the pandemic who were referred to the Orthopaedics and Traumatology Department.

CONCLUSION

The results of this study demonstrated that despite the lockdown restrictions implemented during the COVID-19 pandemic, there was no significant decrease in emergency trauma cases referred to orthopaedics and traumatology compared to the corresponding time period of the previous year. Although the injury patterns varied, as emergency trauma cases were seen at a high rate during the COVID-19 pandemic, treatment plans should be reviewed by establishing new trauma algorithms for this special period.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was approved by Ondokuz Mayıs Unversity Clinical Researchs Ethics Committee (Date: 23.07.2020, Decision Number: 506).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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