

Change in orthopedics and traumatology admissions during the COVID-19 pandemic at a university hospital in Turkey

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ABSTRACT

Objective: The rapidly increasing cases of coronavirus disease 2019 (COVID-19) in Turkey required the reorganization of the health system. The first response to the pandemic in our university hospital was to stop elective surgery on March 30, 2020, minimize outpatient consultations and reduce the number of patients in the wards. To determine the change in the number of patients admitted to our hospital, we examined the data during the pandemic process and compared them with the data of the previous year.

Methods: The number of patients admitted to Pamukkale University Orthopedics and Traumatology Outpatient Clinic and Emergency Service for orthopedic and trauma injuries between March 1, 2020 and October 31, 2020 was documented and compared with the data of the same period in 2019.

Results: During the pandemic period, the number of emergency and outpatient orthopedics and traumatology admissions decreased significantly by 15% and 42.93% respectively ($p < 0.001$). The highest decrease in outpatient admissions was in April 2020 with 79.29%, and the highest decrease in emergency admissions was in March 2020 with 31.35%.

Conclusion: In conclusion, due to fear of getting infected, curfews, and decreased human mobility, there was a dramatic decrease in the number of hospital admissions between March 1, 2020, and October 31, 2020. The COVID-19 pandemic has impacted healthcare in many ways, putting some healthcare systems under great pressure and pushing others beyond their capacity. New strategies can be determined to ensure the continuity of health services and to maximize resources.

Keywords: COVID-19, Trauma, Orthopaedics, Pandemic, Outpatient, Emergency

1. INTRODUCTION

A novel coronavirus, coronavirus disease 2019 (COVID-19), which emerged in Wuhan, China, spread rapidly around the world and was declared a pandemic by the World Health Organization on March 11, 2020 [1]. On the same date, the first COVID-19 case in Turkey was detected and the first death due to the virus was reported on March 17, 2020 [2].

The world was faced with unprecedented global health challenges, with increased cases of COVID-19 causing disruption to healthcare. All over the world, there has been a significant decrease in admissions to health institutions compared to the previous year due to reasons such as lockdown, restriction of mobility due to fear of contamination, and changes in health

service delivery [3,4]. The rapidly increasing cases of COVID-19 in Turkey required the reorganization of the health system. The first response to the pandemic in our university hospital was to cessation of elective surgery, minimize outpatient consultations, and reduce the number of patients in the wards on March 30, 2020. In addition, some wards were converted to COVID-19 care units. On June 1, 2020, the Turkish Ministry of Health published a "gradual" normalization plan [5], and the outpatient clinic, wards and operating rooms in our hospital started to work with 50% capacity based on the patient flow before the pandemic. As of October 2020, our hospital started to accept patients only by online appointment.

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In our university hospital, which is a tertiary healthcare institution, major changes in patient flow were evident during this period. In this study, we reviewed the number of patients admitted to local university hospital orthopedics and traumatology emergency and outpatient clinics in Turkey between 1 March 2020 and 31 October 2020 and aimed to compare them with the data obtained in the same time frame in the previous year.

2. MATERIALS and METHODS

This single-center, retrospective cohort study was performed at Pamukkale University Hospital, Department of Orthopedics and Traumatology in Turkey. The ethical approval of the study was obtained from the Pamukkale University Non-Interventional Clinical Research Ethics Committee. Data were collected through the university hospital registry system. All consecutive patients admitted to the Orthopedics and Traumatology Outpatient Clinic and Emergency Service at Pamukkale University Hospital between March 1, 2020, and October 31, 2020 were recorded and compared to the patient admissions from the same time period in 2019. In recurrent cases, only the first admission was considered. Patients who were consulted by the emergency physician and referred to Orthopedics and Traumatology were included in the emergency service admissions.

Data Collection

Demographic data (age and gender), the admitted department (emergency/outpatient) and the date of admission were recorded. The monthly number of patients admitted to the Emergency Service and Orthopedics and Traumatology Outpatient Clinic between March and October of 2019 and the number of patients admitted during the same time period in 2020 were examined. In addition, Emergency Service and Outpatient Clinic admissions only for March 2019 and March 2020 were examined in detail in two parts: (1) The number of admissions was compared based on the date of 11 March 2020, when the first case was seen in Turkey: the first 10 days of March (1st March to 10th March), and 11th March to 31st March, (2) Weekly comparison was performed for March.

Statistical Analyses

The data was analyzed using SPSS 24.0 (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.) package program. Continuous variables were given as mean \pm standard deviation, median (minimum and maximum) and categorical variable values are presented as absolute numbers (n) and percentages (%). Categorical data were compared with use of the Chi-square (χ^2) test. The conformity of continuous variables with normal distribution was evaluated using the Kolmogorov-Smirnov test. Independent Samples t-test was used for comparison of the groups by age. A p value of < 0.05 was considered significant.

3. RESULTS

The number of outpatient orthopedics and traumatology admissions decreased significantly by 42.93% during the pandemic period ($p < 0.001$). A total of 7850 patients (mean age 39.85 years; 4420 males and 3430 females) were admitted to the outpatient department during the pandemic, and 13755 patients (mean age 40.08 years; 6790 males and 6965 females) were admitted between the same time period in the previous year.

Table I. Descriptive variables of patients

	2019 (March-October)		2020 (March-October)		p
	Min- Max	X \pm SS	Min- Max	X \pm SS	
Age (year) Polyclinic	0-100	40.08 \pm 20.51	0-98	39.85 \pm 19.78	0.421
Age (year) Emergency	1-97	40.90 \pm 24.23	1-99	42.09 \pm 24.96	0.205
	n	%	n	%	
Gender Polyclinic					
Female	6965	50.6	3430	43.7	<0.001
Male	6790	49.4	4420	56.3	
Gender Emergency					
Female	487	32.6	407	32.1	<0.001
Male	1006	67.4	862	67.9	

The number of orthopedics and traumatology emergency admissions decreased significantly by 15% during the pandemic period ($p < 0.001$). A total of 1269 patients (mean age 42.09 years; 862 males and 407 females) were admitted to the emergency service during the pandemic, and 1493 patients (mean age 40.90 years; 1006 males and 487 females) were admitted during the same period a year earlier.

The monthly change in the number of patients in the emergency service and outpatient clinic were presented in Figure 1. During the pandemic period, there was a significant decrease in outpatient admissions in all months. The highest decrease was in April with 79.29% (1840 vs. 381), and the lowest decrease was in June with 11.21% (1356 vs. 1204). Except for May and July, there was also a decrease in emergency admissions during the pandemic period. The highest decrease was in March with 31.35% (185 vs. 127). However, an increase of 8.82% was detected in July (204 vs. 222).

Comparisons before and after March 11, 2020 were presented in Figure 2. Before March 11, both outpatient (573 vs. 591) and emergency admission (43 vs. 50) were similar in both years. However, during the pandemic period, the number of outpatient admissions decreased by 55.39% (1123 vs. 501) and number of emergency admission decreased by 45.77% (142 vs. 77) after March 11.

Weekly comparison of March is presented in Figure 3. In both years, there was a decrease in the number of outpatient admissions from the first week to the last week of March. While

this decrease was 18.63% (467 vs. 380) in March 2019, it was 80.30% (533 vs. 105) in March 2020. However, as of the second week of March, emergency applications decreased by 35.71% (42 vs. 27), 42.22% (45 vs. 26) and 56.36% (55 vs. 24), respectively, when compared to the same period in 2019.

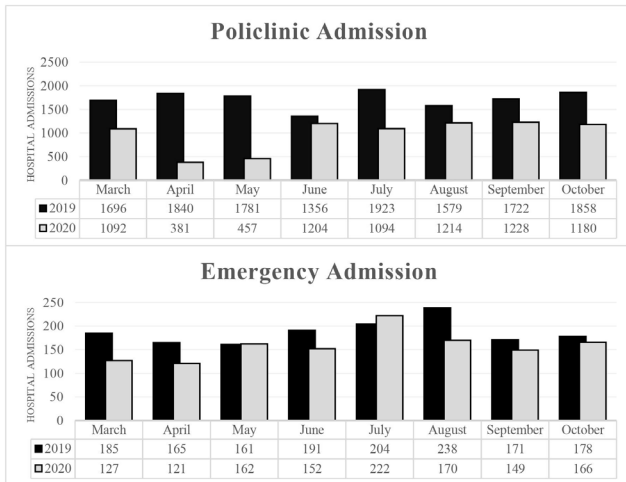


Figure 1. The monthly change in the number of patients in the emergency and outpatient departments

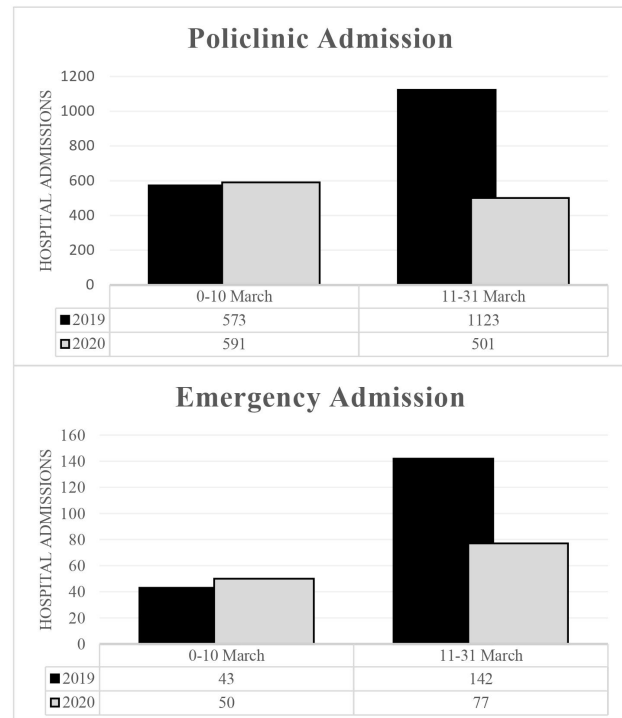


Figure 2. The change in the number of patients in emergency and outpatient clinics before and after 11 March.

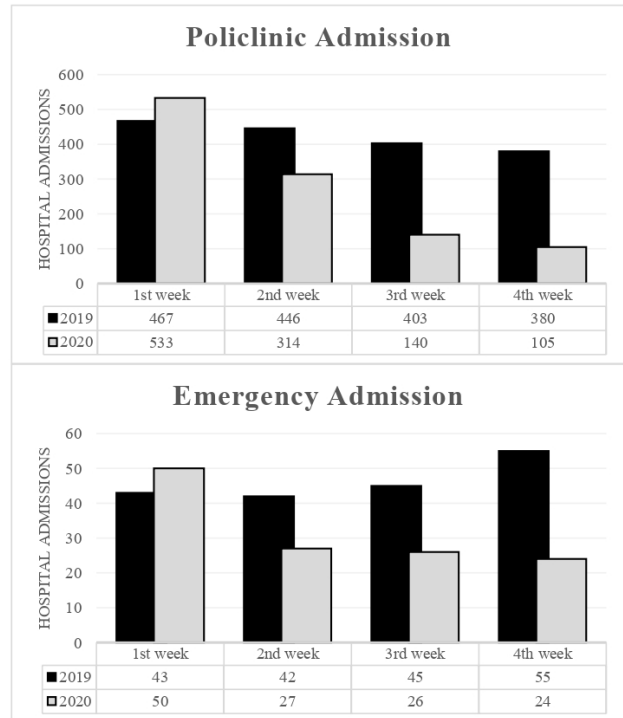


Figure 3. Weekly comparison of March.

4. DISCUSSION

The Turkish Ministry of Health implemented additional measures to limit the spread of COVID-19, and these measures had significant effects on hospital admissions. In this study, the change in orthopedics emergency and outpatient clinic admissions at local University hospital during the pandemic period in Turkey was examined, and it was determined that there was a 42.93% decrease in the outpatient and a 15% decrease in the emergency admissions between March 1, 2020 and October 31, 2020 compared to the previous year admissions.

In addition to the measures taken and curfews, the mobility and social life of people had impacted due to the fear-related issues caused by a pandemic that was spreading rapidly all over the world [6]. Both in Turkey and in other countries, the number of patients who admitted to the hospital after March 2020 was lower than the corresponding periods of the previous year. In studies conducted in tertiary hospitals in Turkey, Kalem et al., found that trauma cases admitted to the orthopedics department of a hospital in Ankara decreased by 50% [7], while Turgut et al., showed that the number of fracture-related applications in Izmir decreased from 1634 to 645 [8]. Significant reductions in trauma cases have been reported during the COVID-19 pandemic in Italy [9], the Republic of Ireland [10], and India [11]. An international study of 63 orthopedics and trauma surgeons from 28 countries reported that 91% of hospitals have reduced workload compared with pre-COVID-19, of which only 17% are performing elective surgeries [12]. In our study,

it was determined that there was a 42.93% and 15% decrease in orthopedics and traumatology outpatient and emergency admissions, respectively, compared to the same period in 2019. The reason for this decrease might be the measures taken in hospitals to minimize transmission, the decrease in high-energy trauma cases such as traffic accidents due to reduced human mobility during the curfew [6]. In addition, COVID-19 cases were the primary focus of the healthcare system in our hospital between March and June 2020, while other patients remained in the background and elective surgeries were postponed. Postponing or canceling hospital appointments due to COVID-19 concerns might also have caused the decline [13].

Due to the cessation of elective surgery, minimizing outpatient consultations, and reducing the number of patients in the wards on March 30, 2020, there was a significant decrease in outpatient admissions in April and May 2020. Although, there was an increase in the number of patients within the framework of the “gradual” normalization plan after June 1, 2020, it was seen that there were still fewer admissions compared to 2019. Although, there was an 8.82% increase in July compared to 2019, there were also decreases in overall emergency admissions. Similarly, when the first COVID-19 case was confirmed in the Netherlands, the rates of utilization of the emergency services in three hospitals between February 15 and May 15, 2020, had gradually decreased [6]. Hospital admissions in the US dropped dramatically in March and April 2020 with the spread of COVID-19, and there was a rebound in the late June – early July [4]. Although, in our study, the orthopedics and traumatology admissions, which decreased rapidly after the first COVID-19 case, increased with the normalization process in June 2020, yet it was still lower than in 2019. We think that this increase might be due to both the normalization process and the increased human mobility in the summer season.

The first case in Turkey was detected on March 11, 2020. The number of outpatient and emergency admissions was similar between March 1-10 in 2019 and March 1-10, 2020. However, after March 11, 2020, admissions to the emergency department and outpatient clinic dramatically decreased. The reason for this may be that with the detection of the first case, people avoid being in crowded enclosed environments such as hospitals due to the panic and fear of contamination. This decrease became more evident as of the 3rd week of March 2020. The curfew covering the age of 65 and over as of March 21, 2020 might have contributed to this [14].

This study has some limitations. The study population is limited to a tertiary hospital in a single province. Multicenter studies can be performed with larger cohorts. However, with gradual normalization, it may not be possible to generalize normalization due to new restrictions or relaxations based on the number of cases in each province in Turkey. Fear of getting infected and restrictions such as postponement of hospital appointments and elective surgeries, social isolation and closures probably kept non-urgent patients out of hospitals. The measures taken since the beginning of the pandemic to prevent and reduce the spread of the virus and maintain the health system capacity had seriously disrupted health services. However, COVID-19 is expected to

stay with us for a while, and uninterrupted healthcare is now inevitable. However, limited data and changing situations with gradual normalization do not allow us to make more specific recommendations beyond sharing our experiences.

In conclusion, there is a significant decrease in orthopedics and traumatology emergency and outpatient clinic admissions between March 1, 2020, and October 31, 2020. As a result, fear of getting infected, curfews, and decreased human mobility, there was a dramatical decrease in the number of hospital admissions. The COVID-19 pandemic has impacted healthcare in many ways, putting some healthcare systems under great pressure and pushing others beyond their capacity. New strategies can be determined to ensure the continuity of health services and to maximize resources.

Compliance with Ethical Standards

Ethical Approval: Local ethical board permission was taken from Pamukkale University, Non-interventional Clinical Research Ethics Committee (Approval number: 60116787-020/73821).

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Conflict of Interest Statement: There is no conflict of interest.

Authors' Contributions: All authors contributed to the study conception and design. MO and YY: Data collection, RS and NB: Analysis and interpretation of data, RS, MO and YY: Drafting the article, NO and NB: Revising the article critically for intellectual content. All authors read and approved the final version of the article.

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