How Has Covid-19 Pandemic Affected Crowded Emergency Services?

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Abstract

Objective: We aimed to investigate the demographic shifts in emergency service admissions, possible measures and room for improvement in emergency services during the Covid-19 pandemic. Methodology: Our study retrospectively analyzed the demographic features and clinical admission types of patients admitted to Batman District State Hospital Emergency Service at two different time periods, one prior to the Covid-19 pandemic and the other during the Covid-19 pandemic. The results were compared between the two periods designated as the pandemic period and the pre-pandemic period. Results: The number of patients admitted to emergency service was 47.681 in the pre-pandemic period and 9455 in the pandemic period ($p<0.01$). The number of patients admitted for trauma was 1247(2.61%) in the pre-pandemic period and 59(0.62%) in the pandemic period ($p<0.01$). The number of patients hospitalized to cardiology department or coronary care unit for acute coronary syndrome was 602(1.26%) in the pre-pandemic period and 29(0.3%) in the pandemic period ($p<0.01$). The number of patients hospitalized to neurological intensive care unit for acute cerebrovascular disease was 542(1.13%) in the pre-pandemic period and 22(0.2%) in the pandemic period ($p<0.01$). The number of patients hospitalized to pulmonary diseases department or intensive care unit for dyspnea was 622(1.21%) in the pre-pandemic period and 515 (5.4%) in the pandemic period ($p <0.01$). Conclusion: Measures taken to prevent the spread of Covid-19 infection have caused a significant drop in emergency service admissions. We are of the opinion that this will lead to an increase in deaths occurring at home, and we will soon encounter patients with worse prognosis and overcrowded emergency services. In order to prevent this problem, we believe that the public awareness about emergency conditions requiring emergency service admission should be heightened alongside of the 'stay home' calls.

What's known?

COVID-19 pandemic, which started in Wuhan on December 1, 2019 and affected the world, caused serious anxiety in healthcare professionals due to chaos that occurred in hospitals, especially in emergency services. Crowded emergency services and inadequacy in inpatient services have revealed the insufficiency of most health systems.

What's new?

The number of patients seen in our emergency services during pandemic unlike the process in Turkey has declined over the world. People are afraid to go to hospitals because of fear and 'stay at home' call. This poses a danger to life-threatening diseases. For this reason, in the pandemic plan, the public should be informed about the urgent conditions that should definitely be applied to the hospital in addition to 'Stay at home' calls.

Introduction:

After the start of a viral outbreak in 1 December 2019 in Wuhan, the capital of Hubei province in China, a novel coronavirus causing the disease called Severe Acute Respiratory Stress Syndrome Coronavirus-2 (SARS-

CoV-2) was discovered (1). The virus, transmitted between humans by droplets, has rapidly spread across the globe, and Covid-19 was declared a pandemic by WHO in 11 March 2020 (2). The first case in Turkey was diagnosed in 10 March 2020. After the first case was diagnosed in Turkey and the Covid-19 pandemic was declared worldwide, domestic measures have begun to be taken in Turkey to prevent virus spread, including regulations on patient admissions to pandemic hospitals (3). The measures taken to slow down virus spread included stopping all international flights, lockdown for individuals older than 65 years or younger than 20 years of age, suspension of all face-to-face educational activities and switching to remote education, generalizing 'Stay Home' campaigns to encourage the public to stay home, shutting down social gathering places such as cinemas and theaters, and minimizing public transportation means. While some hospitals were designated as pandemic hospitals, some others were instructed not to admit suspected Covid-19 cases. Pandemic outpatient clinics were established as units separate from emergency services. Suspected Covid cases were referred to separate pandemic outpatient clinics by front triage zones formed in the vicinity of emergency services (4,5). A front triage system was also established in Batman District Hospital Emergency Service in 28 March 2020, and all patients presenting to the Hospital were first evaluated there. Since then, patients with suspected Covid-19 infection have been examined at separate Covid-19 outpatient clinics outside the emergency service. In contrast to the expectations of increased patient admissions during the period of pandemics because of our hospital being the only state hospital of the province, a significant drop occurred at patient admissions to our emergency service during that period. Thus, we herein aimed to investigate the demographic features of admissions to Batman District State Hospital Emergency Service during and before the pandemic, to determine potential reasons of demographic shifts that occurred between the two periods, and to discuss possible measures that need to be taken in emergency services against a future pandemic.

Methodology

After it was approved by the local ethics committee, this study retrospectively analyzed patient admissions to Batman District State Hospital Emergency Service during two periods, one between 28 March 2019 and 28 April 2019, and the other between 28 March 2020 and 28 April 2020. Our study categorized patient admissions into two groups as the Covid 19 pandemic period and the pre-pandemic period. A front triage system started operating at our hospital in 28 March 2020, with every patient presenting to our hospital having been referred to Covid 19 outpatient clinics or emergency service after being evaluated by the front triage system. The pandemic period group consisted of emergency service admissions that took place for a period of 1 month spanning between 28 March 2020 and 28 April 2020; patients who were younger than 18 years of age and those with inaccessible medical information via hospital automation system were excluded. The pre-pandemic group that was intended to reflect the so-called normal pre-pandemic emergency service functioning, consisted of emergency service admissions that took place during the same period of the calendar year 2019 (28 March 2019 and 28 April 2019). Patients younger than 18 years of age and those with inaccessible medical information via hospital automation system were excluded in that group, too. The patients' demographic features and types of emergency service admissions were recorded.

Results

The number of patients admitted to emergency service was 47.681 in the pre-pandemic period between 28 March 2019 and 28 April 2019 and 9455 in the pandemic period between 28 March 2020 and 28 April 2020. We therefore detected a significant drop in the number of emergency patient admissions in the pandemic period ($p<0.01$). The mean age of patients admitted prior to Covid 19 pandemic was 39.7 ± 22.4 years, and the mean age of patients admitted during the pandemic period was 43.3 ± 21.6 years ($p=0.452$). Among patients admitted to emergency service prior to the pandemic, 29.851 (62.6%) were male, and 5963 (63%) of patients admitted to emergency service during the pandemic were male ($p=0.342$). No significant difference was noted between both groups in terms of age and sex distribution (Table 1).

An analysis of the emergency service admission types showed that 27.701 (58%) patients were examined in green zone (non-urgent cases) in the pre-pandemic period and 3668 (38.7%) patients during the pandemic. We observed a significant decrease in green zone examinations during the pandemic ($p<0.01$). A total of

1247 (2.61%) patients were admitted to emergency service for trauma between 28 March 2019 and 28 April 2019 and 59 (0.62%) patients during the pandemic. There was a significant decrease in trauma admissions during the pandemic ($p<0.01$). Trauma patients consisted of victims of in-vehicle and out-of-vehicle traffic accidents, falls from a height, simple falls, gunshot injuries, and sharp object injuries. While 61% of trauma admissions were due to traffic accidents in the pre-pandemic period, simple falls constituted 71% of all trauma admissions during the pandemic. There was no admission due to gunshot or sharp object injuries during the pandemic. The period comprising March and April is the one when snake bites most commonly occur. According to our results, there occurred 214 cases of snake bites in the pre-pandemic period between 28 March 2019 and 28 April 2019 and 1 case of snake bite during the pandemic. The number of patients hospitalized was 3104 (6.5%) in the pre-pandemic period and 745 (7.8%) in the pandemic period, with both periods being statistically similar with respect to the admission ratio ($p= 0.302$). The number of patients hospitalized to cardiology department or coronary care unit for acute coronary syndrome was 602 (1.26%) in the pre-pandemic period and 29 (0.3%) in the pandemic period ($p<0.01$). The number of patients hospitalized to neurological intensive care unit for acute cerebrovascular disease was 542 (1.13%) in the pre-pandemic period and 22 (0.2%) in the pandemic period ($p<0.01$). There occurred a significant drop in the number of patients admitted for acute coronary syndrome or acute cerebrovascular disease during the pandemic. The number of patients hospitalized to the Pulmonary disease service or pulmonary intensive care unit for dyspnea was 622 (1.21%) in the pre-pandemic period and 515 (5.4%) in the pandemic period, which showed a significant drop in the number of patients admitted to pulmonary diseases service or intensive care unit during the pandemic ($p <0.01$) (Table 2).

Discussion

Batman District State Hospital is the single state hospital in the city center of Batman province. It accepts nearly 1500 patients a day. Apart from Batman District State Hospital, there are an Obstetrics Gynecology and Pediatric Hospital and a few private hospitals in the province. Thus, our hospital is a busy one all year around, and is the first hospital to be likely affected by a pandemic. Emergency services receive the majority of hospital admissions as a result of working on a 24-hour basis and being readily accessible, both worldwide and in our country. Hence, problems arising from overcrowded emergency services increasingly call public attention with an increasing burden of public health problems (6).

Our study found a significant drop in the number of emergency service admissions during the Covid 19 pandemic compared to the normal pre-pandemic period. The first case of Covid 19 was diagnosed in 10 March 2020 (4); however, a global spread of the disease occurred after the first case in Wuhan in 1 December 2019, and raised public awareness of Covid 19 pandemic thanks to the efforts of both nationwide and local press agencies has accelerated public compliance to the preventive measures. We believe that people have tried to stay home as much as possible in response to calls to "stay home" made by the government, and lockdown restrictions imposed on individuals over the age of 65 years and under the age of 20 years have been significantly effective on the drop of emergency service admissions. Hence, the mean age of patients admitted to emergency service during the pandemic belonged to an age group on which no lockdown restrictions have been imposed.

In Turkey, green zone admissions (non-urgent cases) are the majority of emergency service admissions and one of the major causes of emergency service overcrowding (7). There was a significant decrease in green zone admissions during the Covid-19 pandemic. We believe that people have avoided emergency service visits for bearable symptoms due to the concern of getting infected while at hospital. Nevertheless, this may cause a failure to diagnose some life-threatening conditions in a timely manner, making them to present to emergency services with a worse prognosis.

We observed a significant drop in the number of trauma patients during the pandemic. It is beyond doubt that there would have been a significant decrease in the number of trauma patients with the lockdown measures in place and active public calls to stay home, and our results were in agreement with that expectation.

Mortality and morbidity associated with Covid-19 mostly occurs secondary to acute viral pneumonia and

associated severe respiratory distress syndrome (ARDS) (8). Hospitalization of possible Covid 19 cases for clinical observation and follow-up of test results has caused a natural increase in the hospitalization rates of those patients.

Covid-19 may lead to a serious clinical picture that may be characterized by multi-organ dysfunction, sepsis, and diffuse intravascular thrombosis. Therefore, affected patients are also at high risk for acute coronary syndromes and acute cerebrovascular diseases (9,10,11,12). We believe that reduced admission rates to neurology and cardiology departments/intensive care units for acute coronary syndromes and acute cerebrovascular diseases likely resulted from patients affected by these conditions and their relatives avoid visiting hospitals over concerns of being infected while being at hospital. Thus, it is equally important to inform the public about urgent health conditions that absolutely warrant hospital admission as taking measures to slow the infection's spread and making calls to 'Stay Home'. Otherwise, to our opinion, there would be an increase in deaths occurring at home, and we will soon face patients with worse prognosis and overcrowded emergency services.

Conclusion: Measures that have been taken to prevent Covid -19 spread during the pandemic have resulted in a significant decrease in emergency service admissions. We believe that this would increase the rate of deaths occurring at home, and lead emergency services to be overcrowded by patients with worse outcomes and higher mortality rates. To prevent this possibility, we believe that the public should be well informed about urgent conditions that require hospital admission.

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Table 1. Demographic Features

	Pre-pandemic Period	Pandemic Period	P value
The Number of Patients (n)	47.681	9455	p<0.01
Mean age Mean (± SD)	39.7± 22.4	43.3±21.6	p=0.452
Male Sex n(%)	29.851 (62.6%)	5963 (63%)	p=0.342

Table 2. Types of Admissions and Hospitalizations

	Pre-pandemic Period	Pandemic Period	P value
Green Zone (non-urgent cases) n(%)	27.701 (58%)	3668 (38.7%)	p<0.01
Trauma Patients n(%)	1247 (2.61%)	59 (0.62%)	p<0.01
Total Hospitalization n(%)	3104 (6.5%)	745 (7.8%)	p= 0.302
Hospitalized to Cardiology Department n(%)	602 (1.26%)	29 (0.3%)	p<0.01
Hospitalized to Neurology Department n(%)	542 (1.13%)	22 (0.2%)	p<0.01
Hospitalized to Pulmonary disease department n(%)	622 (1.21%)	515 (5.4%)	p <0.01

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