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How Have Visits to the Outpatient Clinic and Emergency Unit of a Tertiary Hospital Changed during the COVID-19 Pandemic?

COVID-19 Pandemisi Sırasında Üçüncü Basamak Bir Hastanenin Polikliniğine ve Acil Servisine Başvurular Nasıl Değişti?

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Abstract

Objective: In this study, determined the attributes of non-Coronavirus disease-2019 (COVID-19) patients and the changes in visits to the emergency service and outpatient departments, hospital admissions and the number of performed surgeries in a tertiary hospital in Turkey during the first weeks of the COVID-19 outbreak. Additionally, the effect of this situation on the hospital's current balance was aimed to be analyzed and compared with the same period of the previous year.

Methods: Emergency services outpatient clinics hospitalization, surgery and checking account balance data from 2019 April to 2020 April (excluding data of those diagnosed with COVID-19) were retrospectively analyzed. Data were statistically compared using the Mann-Whitney U test and analyzed in subgroups.

Results: All parameters declined during the pandemic period and only the decrease in the number of operations was not statistically significant. Particularly, approximately an 8-fold decrease was observed in the checking account balance.

Conclusion: The COVID-19 pandemic has had devastating effects worldwide and these effects persist. It disrupts all the routine practices of hospitals, from emergency services to surgeries. Many hospitals in Turkey have been declared as pandemic hospitals and only patients who presented with emergency conditions can be intervened on. A similar situation occurred in our hospital and a significant decrease was observed in all parameters.

Keywords: COVID-19, tertiary hospital, pandemic, emergency, outpatient

Öz

Amaç: Bu çalışmada, Türkiye'de üçüncü basamak bir hastanede, Koronavirüs hastalığı-2019 (COVID-19) salgınının olduğu ilk haftalardaki COVID-19 dışı hastaların özellikleri ile acil servis ve poliklinik ziyaretlerindeki, hastane başvurularındaki ve yapılan ameliyat sayılarındaki değişikliklerin belirlenmesi amaçlanmıştır. Ayrıca bu durumun hastanenin cari dengesine etkisinin analiz edilerek bir önceki yılın aynı dönemi ile karşılaştırılması amaçlanmıştır.

Yöntem: 2019 Nisan-2020 Nisan tarihleri arasında acil servis, poliklinik, yatış, ameliyat ve cari denge verileri (COVID-19 tanısı konanların verileri hariç) geriye dönük olarak analiz edildi. Veriler, Mann-Whitney U testi kullanılarak istatistiksel olarak karşılaştırıldı ve alt gruplar halinde analiz edildi.



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Öz

Bulgular: Pandemi döneminde tüm parametrelerde düşüş oldu ve sadece ameliyat sayısındaki azalma istatistiksel olarak anlamlı değildi. Özellikle cari dengede yaklaşık 8 kata yakın bir düşüş gözlemlendi.

Sonuç: COVID-19 pandemisinin tüm dünyada yıkıcı etkileri olmuştur ve bu etkiler devam etmektedir. Acil servislerden ameliyatlara kadar hastanelerin tüm rutin uygulamaları bozulmuştur. Türkiye'de pek çok hastane pandemi hastanesi ilan edilmiş ve sadece acil durumlara başvuran hastalara müdahale edilebilmiştir. Benzer bir durum hastanemizde de meydana gelmiş ve tüm parametrelerde anlamlı düşüş gözlemlenmiştir.

Anahtar Kelimeler: COVID-19, üçüncü basamak hastane, pandemi, acil, ayaktan tedavi

Introduction

The disease caused by Severe acute respiratory syndrome-Coronavirus-2 (SARS-CoV-2) was named Coronavirus disease-2019 (COVID-19). Upon the spread of the infection worldwide, it was declared a pandemic by the World Health Organization on March 11, 2020⁽¹⁾. This date was also recorded as the date of the occurrence of the first COVID-19 case in Turkey^(2,3). Although the mortality rate of COVID-19 disease is not known exactly, it has been reported as 2-2.5% in certain publications⁽⁴⁾. The disease reached Europe in a short time and the European country that was impacted the most severely was Italy. The first case in Italy was seen on February 20, 2020, and the number of cases in Italy reached 17.713 on March 18, 2020⁽⁵⁾. The disease has an average incubation period of 5.2 days and it is transmitted from person to person through droplets. It is extremely important to pay attention to social distance to prevent the spread of the disease⁽⁶⁾.

Our knowledge about the COVID-19 and its agent, the SARS-CoV-2, is very limited. The disease generated a high level of anxiety since there is no consensus about its course. New data from China are considered critical for the world and the most common symptom of the disease is reported to be fever⁽⁷⁾. Even though it is speculated that the disease will disappear as the temperatures increase, studies reporting that an increase in temperature would decrease the expected number of cases have also noted that it was not an independent parameter⁽⁸⁾.

The absence of a vaccine for this disease, which is estimated to have a mortality rate of 2-2.5%, has caused anxiety throughout the world. As a result, quarantine practices had to be preferred as the most effective way of preventing the spread of the virus^(4,9). During the pandemic, it was proposed to limit outpatient services and develop mechanisms to filter non-emergency practices until the outbreak was under control⁽¹⁰⁾. Working methods were also arranged by the hospitals in accordance with the COVID-19 pandemic.

Turkey also followed a similar approach, and to ensure social isolation in the country after the occurrence of the first COVID-19 case, many preventive measures were instituted in a short time, which included a curfew. Pandemic hospitals were announced⁽²⁾. Emergency services, outpatient clinics, inpatient services, intensive care units, operating rooms have been reorganized for patients diagnosed with or suspected of having the COVID-19 disease. Because of the policies that encouraged social isolation and staying at home, changes were observed in the number of patients presenting to outpatient clinics and emergency services of hospitals for reasons other than the suspicion of COVID-19, and the number of hospitalizations and operations. Both the arrangements made in the hospitals and the changes in the dynamics of the patients who visited the hospital changed the current balance of the hospitals to a certain extent and caused great damage in medical and economic terms by altering the routine systems of hospitals all over the world⁽¹¹⁾.

In this study, it was determined the attributes of non-COVID-19 patients and the changes in visits to the emergency service and outpatient departments, hospital admissions and the number of performed surgeries in a tertiary hospital in Turkey during the first weeks of the COVID-19 outbreak. Additionally, the effect of this situation on the hospital's current balance was aimed to be analyzed and compared with the same period of the previous year.

Materials and Methods

Our study is a single-center, retrospective observational study. This study was conducted in a large tertiary hospital equipped with all medical and surgical specialties in Turkey's Izmir province. More than 1 million annual presentations are made at the hospital where the study was conducted. A total of 186616 patients who presented to the hospital's outpatient clinic and emergency service between April 1, 2019 and April 30, 2019 in the pre-COVID 19 period and 28432 patients who presented to the hospital's outpatient clinic and emergency service for reasons other than COVID-19 between April 1,

2020 and April 30, 2020, during a time when there were approximately 1100 COVID-19 positive patients in Izmir, were included in the study. Data regarding the visits made to the emergency service and polyclinics anonymized to ensure that individual rights protected. The International Classification of Diseases -10th revision (ICD-10) codes entered into the system were retrieved from the electronic registry database. The patients were divided according to the pre-COVID 19 and COVID-19 period, s and then subdivided according to the ICD-10 code. The number of emergency services outpatient clinic attendances, hospitalizations and operations were evaluated. Additionally, the hospital's checking account balance data from these periods were also calculated according to the same categories.

Statistical Analysis

Statistical differences between pre-pandemic (April 2019) and pandemic (April 2020) parameters and descriptive data were evaluated using the Statistical Package for the Social Sciences 25 software. The Mann-Whitney U test was used for statistical analysis. A value of $p < 0.05$ was considered as significant. Ethical approval was obtained from the Tepecik Education and Research Hospital Ethical Committee. IRB name was University of Health Sciences Turkey, İzmir Tepecik Education and Research Hospital Clinical Trials Ethical Committee and the approval number was 2020/5-13.

Results

Due to the COVID-19 pandemic, a significant decrease was observed in emergency service and outpatient clinic visits. In April 2019, a total of 186,616 patients presented to our hospital's emergency service and outpatient clinic. Of these visits, 50,675 (27.1%) were emergency presentations. In the same period of 2020, a total of 28,432 patients presented to our hospital's emergency and outpatient clinic for reasons other than COVID-19. Of these visits, 12,680 (44.5%) were emergency presentations. According to the analysis of the number of patient visits to the hospital during these two periods, the percentage of emergency presentations

increased in 2020 and a statistically significant decrease was observed in outpatient clinic visits ($p < 0.001$) (Figure 1, Table 1).

In April 2019, 18,118 patients were hospitalized. Surgical interventions were performed on 3,644 of these patients. In the same period of 2020, 5,255 patients were hospitalized in our hospital for reasons other than COVID-19, and 702 of these patients underwent surgical intervention. When the number of patients who were hospitalized and underwent surgical interventions were compared between these two periods, a statistically significant decrease was observed in the number of hospitalized patients ($p < 0.001$) and although the number of patients who underwent surgery decreased numerically, this decrease was not found to be statistically significant ($p = 0.088$) (Figure 1, Table 1).

While the checking account balance of our hospital was 13,787,987.18 TL (Turkish Liras) in April 2019, it decreased by 7.5 times to 1,796,009.22 TL in the same period of 2020 and this decrease was found to be statistically significant ($p < 0.001$) (Figure 1, Table 1).

When the subgroup analysis regarding emergency service visits was considered, the most common diagnoses made in April 2019 were soft tissue disorders (M79) ($n = 6768$), abdominal pain (R10) ($n = 6102$), acute upper respiratory tract infections (J06) ($n = 3554$) and the most common

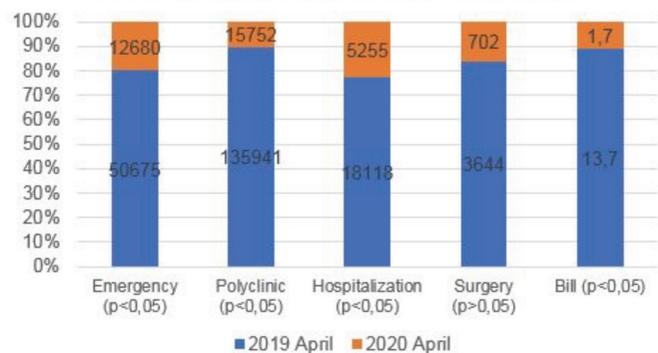


Figure 1. Comparison of data for April 2019 and 2020

Table 1. Statistical analysis of parameters April 2019 and 2020

	April 2019-2020 emergency	April 2019-2020 polyclinic	April 2019-2020 hospitalization	April 2019-2020 surgery	April 2019-2020 bill
Mann-Whitney U	1911,000	940,000	1517,000	2342,000	634,500
Wilcoxon W	4396,000	3425,000	4002,000	4827,000	3119,500
Z	-2,460	-6,293	-3,912	-0,654	-7,567
Asymp. Sig. (2-tailed)	0.014	0.000	0.000	0.513	0.000

diagnoses other than COVID-19 in the same period of the following year were abdominal pain (R10) (n=1206), soft tissue disorders (M79) (n=1064) and pregnancy-related conditions (O26) (n=849), respectively, according to the ICD-10 codes (Table 2).

Considering the subgroup analysis regarding outpatient visits, the most common diagnoses made in April 2019 were general medical examination (Z00) (n=7688), non-insulin-dependent diabetes mellitus (E11) (n=4025) and pregnancy-related conditions (O26) (n=4015) and the most common diagnoses made in the outpatient clinic other than COVID-19 in the same period of the following year were medical observation and evaluation for suspicious diseases and conditions (Z03) (n=1081), pregnancy-related conditions (O26) (n=996), general medical examination (Z00) (n=772), respectively, according to the ICD-10 codes (Table 3).

Considering the subgroup analysis of the performed surgical interventions, the most common surgical procedures performed in April 2019 were diagnostic intravitreal puncture/injection (n=373), therapeutic curettage (n=357), selective coronary angiography (n=298), and the most common

surgical procedures in the same period of the following year were normal delivery (n=188), cesarean (n=183) and selective coronary angiography (n=101), respectively (Figures 2, 3).

Discussion

As the pandemic period dragged on, economic problems have emerged in addition to the health problems caused by the virus. The virus has threatened the entire world in terms of both health and economy, almost compromising the functioning of hospitals, causing hospitals to lose their functionality in some places⁽¹²⁾. The fact that hospitals only care for COVID-19-related patients and that people refrain from visiting the hospital because of fear or legal obligations, has further reduced the number of patient visits to hospitals⁽¹⁰⁾. There are studies in the literature that have addressed this decrease.

In a study by Madanelo et al.⁽¹⁰⁾, admissions to the urology emergency department of the tertiary hospital during the pandemic period were compared with the same period of the previous year and it was found that the number of patients decreased by 46.4% during the pandemic period. The same

Table 2. Emergency service diagnosis subgroups and values by years

2019	Diagnosis	Number	Bill
Soft tissue disorders	M79	6768	474998,2
Abdominal pain	R10	6102	457149,9
Acute upper respiratory tract infections	J06	3554	103145,4
Routine child health examination	Z00	3315	136996
Chest pain	R07	2131	214884
Fall	W19	1602	226699,8
Non-infective gastroenteritis and colitis	K52	1527	75478,31
Headache	R51	1151	91201,68
Conditions due to pregnancy	O26	1045	31961,51
Nausea and vomiting	R11	822	67265,92
2020	Diagnosis	Number	Bill
Conditions due to pregnancy	O26	849	29064
Abdominal pain	R10	1206	174619,5
Chest pain	R07	589	90724,16
Routine child health examination	Z00	753	67456,71
Fall	W19	495	75839,26
Infectious diseases, other and unspecified	B99	290	80091,28
Soft tissue disorders	M79	1064	93144,35
Medical observation and evaluation for suspected diseases and conditions	Z03	360	71105,76
Dyspnea	R06	203	61091,14
Acute upper respiratory tract infections	J06	306	20360,01

Table 3. Polyclinic diagnosis subgroups and values by years			
2019	Diagnosis	Number	Bill
General medical examination	Z00	7688	507321,6
Insulin-dependent diabetes mellitus	E11	4025	274228
Conditions related to pregnancy	O26	4015	270951
Back pain	M54	3553	319034,8
Vitamin D deficiency	E55	3411	286556,2
Urinary system disorder, unspecified	N39	3222	185637,9
Essential (primary) hypertension	I10	2864	204941
Soft tissue disorders	M79	2735	176307,9
Refraction and accomodation disorders	H52	2438	102701,7
Ordinary gynecological examination	Z01	2183	137857,1
2020	Diagnosis	Number	Current
Medical observation and evaluation for suspected diseases and conditions	Z03	1801	313012,1
Conditions related to pregnancy	O26	996	92002,39
General medical examination	Z00	772	56881,28
Single live birth in hospital	Z38	768	14929,99
Ordinary gynecological examination	Z01	587	23472,34
Soft tissue disorders	M79	393	27949,39
In suspicious fetal problems - maternal care	O36	375	32797,92
Essential (primary) hypertension	I10	321	24934,53
Seasonal allergic rhinitis	J30	272	17193,85
Insulin-dependent diabetes mellitus	E11	248	16958,58

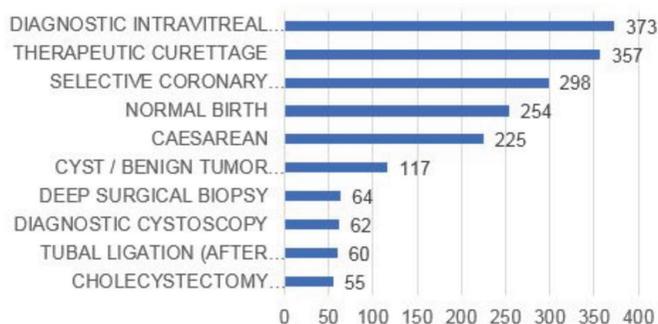


Figure 2. Most frequent operations and numbers in 2019 April

study also compared the mean age of the patients and did not determine a significant difference. In a similar study by Santana et al.⁽¹³⁾ the rate of this reduction was found to be 45%.

In another study examining patient visits to a tertiary dermatology clinic before and during the pandemic period, it was found that the number of patients decreased by 71.9% in the pandemic period; this decrease was found to be more pronounced in children, women and patients over 70 years

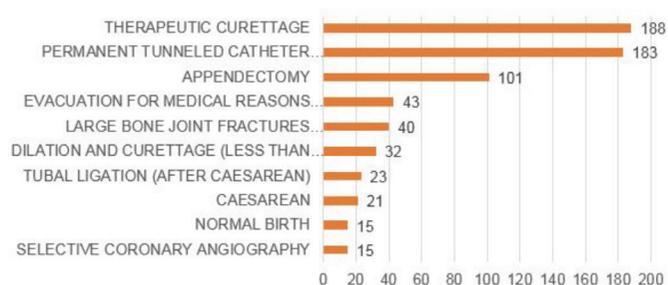


Figure 3. Most frequent operations and numbers in 2020 April

of age⁽¹⁴⁾. In the same study, the patients were analyzed in subgroups and while presentations with skin conditions such as atopic dermatitis and lichen planus decreased during the pandemic period, presentations with skin disorders induced by drug intake, erysipelas, syphilis and primary cutaneous lymphoma demonstrated an increase⁽¹⁴⁾.

Similar findings were contributed by studies conducted in Italy, indicating a significant decrease in admissions, especially in the pediatric age group⁽¹⁵⁾. The decrease in the attendances by pediatric patients was attributed to the high

anxiety levels of their families in the literature, and it has been reported that the children who in fact require urgent treatment do not present to the hospital due to the fear of their parents⁽¹⁶⁾. We think that the decrease observed in the visits by elderly patients is especially because the authorities emphasized that the disease progresses more severely in elderly patients. In the study by Reznik et al.⁽¹⁷⁾ it was found that female patients were more concerned about the COVID-19 disease and a sharp decline was reported in the attendance of female patients.

Similar to the literature, our study found a significant decrease in the total patient presentations to the emergency department. While there were 50 675 presentations to the emergency department in April 2019, there were 12 680 presentations in April 2020, indicating a decrease by 75%. Non-emergency outpatient visits were also evaluated in our study, and while 135941 visits were detected in April 2019, there were 15752 visits in April 2020, showing a decrease by 88%. The decrease in the number of presentations found in our study, especially in non-emergency outpatient clinic visits, shows that the patients try isolating themselves and present to the hospital only when it is necessary.

The most striking finding regarding the diagnoses associated with emergency service visits is that pregnancy-related admissions persisted during the pandemic period, and despite constituting one of the most common reasons for attendance before, the rates of soft tissue disorders and abdominal pain decreased by 80% compared to 2019.

When we consider the diagnoses associated with outpatient clinic visits, it is seen that the number of visits declined by 70%-80% in all diagnostic groups (75% in cases related to pregnancy). This situation shows us that the patients did not present to the hospital during the pandemic period unless they had to. To briefly address the case of pregnant patients; even though pregnant women avoided visiting the hospital, they used emergency services in case of necessity and did not visit the polyclinics as frequently. This situation also shows us that our citizens are making an effort to not overburden the hospitals during the fight against COVID-19 in our country.

Regarding the number of operations, elective surgeries have been abandoned and only emergency operations have been performed worldwide to ensure patient safety and a more effective fight against the virus^(18,19). A study conducted in England has reported that the bill to the British state corresponds to 2 billion Euros⁽²⁰⁾.

In our hospital, 3644 and 702 surgeries were performed in 2019 and April 2020, respectively, and a decline by 80% was observed during the pandemic period. Although the numerical decrease in the number of emergency, outpatient clinic attendances and hospitalization was found to be statistically significant ($p < 0.001$), the decrease in the number of operations was not statistically significant ($p > 0.05$). The number of patients who were hospitalized also presented a similar pattern; there were 18118 and 5255 hospitalizations, respectively, in April 2019 and 2020, with a 70% reduction.

When we consider the distribution of the types of performed surgeries, diagnostic intraocular procedures were in the first place in 2019, while during the pandemic period, pregnancy-related emergencies such as normal delivery and cesarean delivery were the two most common procedures. The reason for this was that the Ministry of Health halted the performance of elective surgeries during the pandemic period and only allowed emergency surgeries.

Because of the decrease in the number of emergency and outpatient clinic attendances, surgeries and hospitalizations, the checking account balance of our hospital was also affected and while the checking account was 13,787,987 TL in 2019, it was found to be 1,796,009 TL in 2020, indicating a decrease of 80% ($p < 0.05$).

Study Limitations

Since the study is retrospective and covers the early stages of the COVID-19 epidemic, the deficiencies in the data constitute the limitations of the study. Similarly, the changes in the COVID-19 dynamics between the time the study was conducted and the current period cast doubt on the adaptability of the study to the present.

Conclusion

In conclusion, the number of hospital visits and operations decreased significantly, the percentage of emergency presentations increased, only emergency surgeries were performed, and the current balance of hospitals was negatively affected during the COVID-19 period. Considering these data, it has been seen that the COVID-19 not only affects the medical domain but also financial impacts the healthcare workers whose income is partly dependent on the income of the hospital. To have a more comprehensive knowledge about this issue multi-centered studies needed.

Ethics

Ethics Committee Approval: The study were approved by the University of Health Sciences Turkey, Tepecik Education and Research Hospital Clinical Trials Ethical Committee and the approval number was 2020/5-13, date: 27.04.2020.

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: M.E., M.Z.K., Design: M.E., M.Z.K., Data Collection or Processing: M.E., M.Z.K., Analysis or Interpretation: M.E., M.Z.K., Literature Search: M.E., M.Z.K., Writing: M.E., M.Z.K.

Conflict of Interest: No conflict of interest was declared by the authors.

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