

# How An Emergency Can Effect Urological Emergencies: COVID-19

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## What's known on the subject? and What does the study add?

During the pandemic period, the number of consultations requested from the urology department decreased, as the number of admissions to the emergency department (ED). On the other hand, the number of hospitalizations in the urology ward of patients consulted from the ED has increased. In our study, it was determined that the highest decrease in consultations requested due to renal colic, while the number of consultations requested due to urinary tract infection increased. The results obtained from this study are important in terms of revealing which urological emergencies are affected.

## Abstract

**Objective:** Coronavirus disease-2019 (COVID-19) has caused many changes in the health services since its inception. The change in the functioning of the emergency services and the decrease in admissions have also changed the form of consultations requested from the urology clinic. This study aims to reveal how the consultations requested from the urology clinic of a large hospital were affected during the COVID-19 period.

**Materials and Methods:** In our study, one year before and after March 10, 2020, was divided into two groups as "pre-covid" and "covid era". The gender, age, reason for consultation, result, date and time, hospitalization status of the patients were examined.

**Results:** A total of 2018 consultations, 1242 in the pre-COVID period and 776 during the COVID period, were analyzed in the study. Although renal colic was the most common reason for consultation in both periods, its number and rate decreased significantly during the COVID period [384 (30.9%) vs. 165 (21.3%),  $p \leq 0.0001$ ]. Proportionally, more patients were hospitalized during the COVID period [196 (15.8%) vs. 161 (20.7%),  $p=0.02$ ]. In both periods, the most common reason for hospitalization was hematuria, but the difference was not statistically significant [26 (29.5%) vs. 20 (27.8%),  $p=0.261$ ].

**Conclusion:** COVID-19 has turned all health parameters upside down and has been one of the biggest factors affecting public health since the day it started. While the density and form of consultation requested from the urology clinic changed during the pandemic period, the hospitalization rates increased, so urology clinics should adapt accordingly for possible pandemic waves or epidemics in the future.

**Keywords:** Urology, emergencies, COVID-19

## Introduction

No one could have predicted that a disease that emerged in China in December 2019 could affect the world in so many ways. The coronavirus disease-2019 (COVID-19) outbreak, which was declared a pandemic in March 2020, is perhaps the most important event of the 21<sup>st</sup> century (1). According to official authorities, COVID-19 has caused 6.3 m deaths, but some sources even claim that the estimated global excess mortality rate is three times greater (2). This serious situation has deeply affected

the social, economic, and cultural lives of individuals, especially in the area of health. In Türkiye, the first case was reported on March 10, 2020, and since then, more than seven million people have contracted the virus and more than 64 thousand have died (3,4). Because of the rapid transmission of COVID-19 in social environments, various measures have been taken, both at governmental and individual levels, including quarantine, transportation restriction, closure of non-essential workplaces, and interruption of formal education (5). These conditions have also substantially changed the provision of health services.

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With the beginning of the pandemic, an increasing number of patients presented to emergency departments (ED) with respiratory distress and required hospitalization. Different from their daily routine operations, EDs became the first gateway to which patients with COVID-19 presented. However, ED visits due to other health reasons were delayed because of social and personal isolation measures. Therefore, compared with the pre-pandemic period, there was a 50% decrease in ED presentations (6).

This study aimed to reveal the effects of the COVID-19 pandemic on consultations requested from the urology clinic of a large hospital receiving more than one million ED visits per year and provide data that will assist in the management of health services in future pandemics or diseases that may affect public health.

## Materials and Methods

In this study, all consultations requested from ED to the urology clinic at Bursa Yüksek İhtisas Training and Research Hospital between March 10, 2019, and March 10, 2021, were screened through the hospital information management system. The data belonging to the year before March 10, 2020, when the first case and quarantine measures were announced in Türkiye, were grouped as the "pre-COVID-19 period," and those belonging to one year starting from the beginning of the pandemic period were grouped as "the COVID-19 period." Each group was evaluated over four quarters of three months, with Q1, Q2, Q3, and Q4 representing the pre-COVID-19 period and Q5, Q6, Q7, and Q8 representing the COVID-19 period. The fifth quarter (Q5) reflected the first effects of the pandemic. In Türkiye, national restrictions and quarantines were implemented from March 21, 2020, to June 1, 2020, and from November 17, 2020, to March 10, 2021 (7). Various restriction measures were applied at the national level during the Q5, Q7, and Q8 quarters of the pandemic time.

All the consulted patients, regardless of age, were included in the study. To ensure the homogeneity of the data and exclude the possible urological side effects of COVID-19, patients who were positive for COVID-19 according to the polymerase chain reaction test performed at the time of presentation to ED were excluded from the study. The patients' gender, age, reason for consultation, results, date and time of presentation, and hospitalization status was evaluated. Consultation hours were divided into three groups: 08:00-16:00, 16:00-24:00, and 24:00-08:00. The study was approved by the ethics committee of the hospital with the decision number 2011-KAEK-25 2021/07-30 (Bursa Yüksek İhtisas Training and Research Hospital Clinical Research Ethics Committee). Informed consent was not obtained because the study was planned retrospectively.

## Statistical Analysis

The data were analyzed with the Shapiro-Wilk test to determine whether they showed a normal distribution. The results were

presented as mean ± standard deviation, minimum, and maximum, or frequency and percentage values. Normally distributed data were compared with the Independent Samples t-test or One-Way analysis of variance. The Bonferroni test was used as a multiple comparison method. Categorical variables between the groups were compared using Pearson's chi-square test. Statistical significance was defined as  $p < 0.05$ . IBM SPSS ver. 25.0 was used to perform statistical analyses and construct graphs.

## Results

A total of 2,018 consultations, 1,242 in the pre-COVID-19 period and 776 during the COVID-19 period, were included in the study. During the pandemic, the number of consultations requested from the ED to the urology clinic decreased by 37% ( $p < 0.0001$ ). Especially in the first three months of the pandemic, the number of consultations requested decreased by 48.7% compared to the same period a year before (371 versus 190). When the same periods of the two years were compared, the difference decreased to 12.2% over time. Demographic data and consultation characteristics are shown in Table 1. No significant difference was found between the groups in terms of the mean age and gender. However, the mean age of the inpatients was found to be higher than the patients treated in the outpatient setting ( $57.23 \pm 19.1$  vs.  $53.4 \pm 21.1$ ,  $p = 0.002$ ). In both periods, most consultations were requested between 16:00 and 24:00.

**Table 1. Demographic data and clinical outcomes of the patients**

	Pre-COVID-19 period	COVID-19 period	p-value
Consultations (n)	1,242	776	
Age (mean, min-max)	53.7 (5-97)	54.5 (5-96)	>0.05
Sex			
• Male	961 (77.4%)	599 (77.2%)	>0.05
• Female	281 (22.6%)	177 (22.8%)	
Time of consultation			
• 08:00-16:00	487 (39.2%)	269 (34.7%)	0.04
• 16:00-24:00	566 (45.6%)	364 (46.9%)	>0.05
• 24:00-08:00	189 (15.2%)	143 (18.4%)	>0.05
Consultation results			
• Outpatient treatment	974 (78.4%)	582 (75%)	>0.05
• Admission to the inpatient urology ward	196 (15.8%)	161 (20.7%)	0.004
• Admission to other wards	72 (5.8%)	33 (4.3%)	>0.05
Outcomes of patients admitted to the urology ward			
• Medical treatment	108 (55.1%)	89 (55.3%)	>0.05
• Operation	88 (44.9%)	72 (44.7%)	
COVID-19: Coronavirus disease-2019, min-max: Minimum-maximum			

However, in the pre-COVID-19 period, more consultations were requested during daytime hours (8:00-16:00,  $p=0.04$ ).

Reasons for requesting consultation are showed in Table 2. In both periods, the most common reason for consultation was renal colic. During the COVID-19 period, there was a statistically significant decrease in both the number and ratio of patients presenting with renal colic ( $p<0.0001$ ). Ureteral stones were detected in 182 (47.4%) and 98 (59.4%) patients presenting with renal colic in the pre-COVID-19 and COVID-19 periods, respectively, and the difference was statistically significant ( $p=0.01$ ). Similarly, the number of patients consulted for urological problems secondary to orthopedic trauma significantly decreased during the COVID-19 period ( $p=0.05$ ). Consultations requested due to hematuria, urinary tract infection (UTI), and postrenal acute kidney injury proportionally

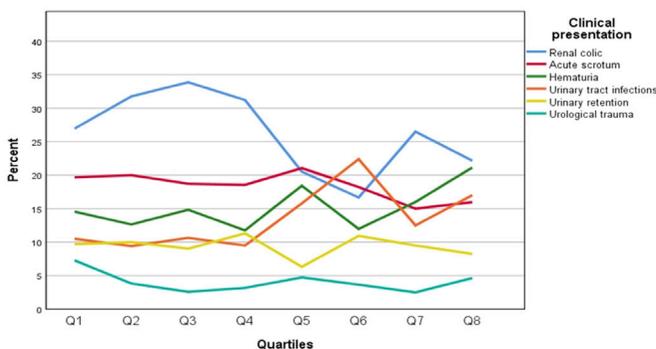
increased during the COVID-19 period. The distribution of the six most common reasons for urological consultations is given in Figure 1 according to the quarterly evaluation.

While 196 (15.8%) of the consulted patients were admitted to the urology ward in the pre-COVID-19 period, 161 (20.7%) were hospitalized during the COVID-19 period. Proportionally, more patients were hospitalized during the COVID-19 period ( $p=0.02$ ). Eighty-eight (44.9%) of the 196 patients hospitalized in the pre-COVID-19 period underwent surgery: 26 (29.5%) for the investigation and treatment of the etiology of hematuria, 14 (15.9%) for renal colic (bilateral ureteral stone, ureteral stone in a solitary kidney, etc.), and 13 (14.8%) for acute scrotum (testicular torsion, testicular trauma, etc.). During the COVID-19 period, 72 (44.7%) of the 161 patients who were admitted to the wards underwent surgery [20 (27.8%) for the investigation and treatment of the etiology of hematuria, 17 (23.6%) for acute scrotum, and 16 (22.2%) for renal colic]. No significant difference was found between the two periods in terms of the interventions performed ( $p=0.396$ ).

**Table 2. Reasons for urological consultations**

Reasons for urological consultation	Pre-COVID-19 period	COVID-19 period	p-value
Renal colic	384 (30.9%)	165 (21.3%)	<0.0001
Acute scrotum	238 (19.2%)	138 (17.8%)	>0.05
Gross hematuria	167 (13.4%)	133 (17.1%)	0.023
Urinary tract infection	126 (10.1%)	130 (16.8%)	<0.0001
Urinary retention	122 (9.8%)	69 (8.9%)	>0.05
Urological trauma	55 (4.4%)	30 (3.9%)	>0.05
Orthopedic trauma	46 (3.7%)	12 (1.5%)	0.005
Postrenal acute kidney injury	36 (2.9%)	44 (5.7%)	0.002
Incidental mass	12 (1%)	8 (1%)	>0.05
Fournier's gangrene	7 (0.6%)	3 (0.4%)	>0.05
Priapism	2 (0.2%)	5 (0.6%)	>0.05
Penile fracture	2 (0.2%)	3 (0.4%)	>0.05
Anuria	2 (0.2%)	2 (0.3%)	>0.05
Other	43 (3.5%)	34 (4.4%)	>0.05
Total	1242	776	

COVID-19: Coronavirus disease-2019



**Figure 1.** Six most common reasons for urological consultations according to their quartile distribution

## Discussion

With the unavoidable spread of COVID-19, there was an unprecedented, rapid transformation in healthcare services. Standard healthcare parameters have rapidly changed, with most health services being allocated to patients with COVID-19. Under these circumstances, EDs and wards and intensive care beds were rearranged to primarily provide ventilation support for these patients. Many countries have taken quarantine measures to prevent the pandemic from spreading rapidly, and the health systems of some countries were overburdened by increasing demands (8). In addition to social measures, strict isolation measures were applied because of the fear of contracting an unknown disease. As a result, the demand of individuals for standard health services decreased. In a previous study, it was reported that the average daily outpatient clinic admissions decreased by 71% with the implementation of isolation measures (9). This decrease was also seen in ED presentations. In a study conducted in Germany, it was shown that ED visits decreased by 38% following isolation measures (10). In another study, it was shown that ED presentations decreased by 42% between March 29 and April 25, 2020, compared to the same period of the previous year (11). Similarly, in our hospital, the annual average number of ED presentations decreased from 1,201,614 in the pre-COVID-19 period to 716,989 during the COVID-19 period, indicating a 40% reduction.

Along with the decrease in the number of patients presenting to the ED, the number of consultations requested from ED also decreased. Both the restriction of access to the hospital due to quarantine conditions and the absence of truly non-urgent

consultations reduced the number of consultations requested from the urology clinic during this period (12). In our study, the number of consultations requested from the urology clinic decreased by 37% compared to the previous year (1.242 vs. 776,  $p < 0.0001$ ). In another study conducted in Türkiye, it was reported that there was a 72% decrease in consultations made by ED (13). When the reasons for consultations were examined, it was observed that the highest decrease was seen in the number of consultations made for renal colic (57%, 384 vs. 164,  $p < 0.0001$ ). Although the rate of consultations due to UTI significantly increased compared to the previous year, there was no significant difference between the number of infections requiring hospitalization, contrary to the expectation of severe UTI due to delayed hospital visits [38 (30.2%) vs. 32 (24.6%)  $p = 0.539$ ]. Similarly, many studies have reported a decrease in the number of patients presenting to hospitals with trauma under quarantine conditions (6,10). In parallel with this decrease, studies have also shown an 85% decrease in the number of patients referred to the urology clinic because of trauma (13). In our study, the proportion of the patients consulted for urological trauma secondary to orthopedic trauma significantly decreased ( $p = 0.005$ ), although the number of those consulted for primary urological trauma decreased, the difference was not statistically significant ( $p > 0.05$ ).

During the COVID-19 period, urological operations were mostly performed due to trauma, testicular torsion, penile fracture, massive hematuria, Fournier's gangrene, etc. according to the European Association of Urology guidelines (14). Under the pandemic conditions, the primary goal was to protect patients against COVID-19 transmission. However, in our study, the proportion of patients requiring hospitalization increased compared with the pre-pandemic period (15.8% vs. 20.7%,  $p = 0.004$ ). In a previous study, a similar increase was observed, which was attributed to the limitations concerning outpatient clinic examinations and postponement of elective operations, resulting in the exacerbation of urological diseases (15). Similarly, in another study, there was an increase in the rate of consultations resulting in invasive procedures (12). However, Alkis et al. (16) reported that the rate of invasive interventions decreased by 3% in consultations made by ED.

### Study Limitations

The most important limitation of our study concerns its single-center nature. Another limitation is that some patients may have presented to nearby hospitals because of the fear of contamination since our hospital was designated as a reference COVID-19 care center in and around Bursa during the pandemic period. Despite this, we examined the effect of the COVID-19 period on urological emergencies with the largest number of patients and the longest timeframe in the literature. Our study is also important since it contributes to the knowledge pool on

COVID-19 to minimize the impact of similar pandemic waves or other future pandemics on urological emergencies.

### Conclusion

Since the day it was initiated, COVID-19 has caused all health parameters to change radically and has become one of the greatest factors affecting public health. During the pandemic period, the proportion and number of patients consulted for UTI increased. Similarly, the possibility of hospitalization increased during the pandemic period. The results obtained from this study are important in terms of revealing which urological emergencies have been affected and to what extent in the presence of restrictions imposed due to pandemic conditions.

### Ethics

**Ethics Committee Approval:** The study was approved by the ethics committee of the hospital with the decision number 2011-KAEK-25 2021/07-30 (Bursa Yüksek İhtisas Training and Research Hospital Clinical Research Ethics Committee).

**Informed Consent:** Informed consent was not obtained because the study was planned retrospectively.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Surgical and Medical Practices: A.E., G.D., Concept: A.E., M.D., Design: A.E., M.D., Data Collection or Processing: G.D., Ç.B., Analysis or Interpretation: G.D., M.K., Literature Search: A.E., Ç.B., Writing: A.E., M.K.

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

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