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CLINICAL RESEARCH / KLİNİK ARAŞTIRMA

The Evaluation of the Impact of the COVID-19 Pandemic on Urologic Emergencies

COVID-19 Pandemisinin Ürolojik Aciller Üzerindeki Etkisinin Değerlendirilmesi

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Abstract

Objective: Evaluating the impact of the coronavirus disease-2019 (COVID-19) pandemic on emergency urology patient profile and assessment of the approach to these patients.

Methods: Records were kept on the age, gender, application time, reason for application, comorbidities, hospitalization requirement, hospitalization duration, anticoagulant use, places of residence, complications, and treatment approaches for emergency urology patients with urological consultation requirement. The period between March 11, 2020 when the first COVID-19 case was encountered in Turkey and June 01, 2020 when the transition to gradual social life started was defined as the "COVID period", whereas the period between March 11, 2019-June 01, 2019 was defined as the "non-COVID period" parameters for both periods were compared via statistical methods.

Results: A total of 63 patients applied during the non-COVID period, whereas 27 patients applied during the COVID period. A statistically significant difference was not observed between the two periods about age, gender, time of application, reason for application, and treatment approach for the patients ($p>0.05$). However, it was determined during the COVID period that hospitalization duration decreased ($p=0.027$), number of applications of patients using anticoagulants increased ($p=0.015$), and the number of patients from rural areas decreased at a statistically significant level ($p=0.023$). No statistically significant difference was observed between the interventional and medical treatment approaches ($p=0.28$). No complications were observed during either period.

Conclusion: The COVID-19 pandemic is a process in which urological emergency applications, the ratio of patients coming from rural areas, and the hospitalization duration decrease.

Keywords: COVID-19, coronavirus, pandemics, urology, emergencies

Öz

Amaç: Korona virüs hastalığı-2019 (COVID-19) pandemi sürecinin ürolojik yakınmalar ile acil servise başvuran hasta profili üzerindeki etkilerini ve bu hastalara yaklaşımı değerlendirmektir.

Yöntem: Acil servise başvurup üroloji konsültasyonu istenen hastaların yaş, cinsiyet, başvuru zamanı, başvuru nedeni, komorbiditeler, hospitalizasyon gerekip gerekmemesi, hospitalizasyon süresi, antikoagülan kullanımı, yaşadıkları yer, komplikasyonlar ve tedavi yaklaşımı kaydedildi. Türkiye'de ilk COVID-19

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Öz

olgusunun görüldüğü 11 Mart 2020 tarihi ile kademeli sosyal hayata geçişin başladığı 01 Haziran 2020 tarihleri arası "COVID dönemi", 11 Mart 2019-01 Haziran 2019 "non-COVID dönemi" olarak tanımlandı. Her iki döneme ait parametreler uygun istatistiksel yöntemlerle karşılaştırıldı.

Bulgular: Non-COVID döneminde 63 hastaya karşın COVID döneminde 27 hasta başvurdu. Her iki dönem arasında hastaların yaş, cinsiyet, başvuru zamanı, başvuru nedeni, tedavi yaklaşımı açısından istatistiksel anlamlı fark izlenmedi (p>0,05). Buna karşın COVID döneminde hastaların hospitalizasyon süresinin kısaldığı (p=0,027), antikoagülan kullanan hasta başvurularının arttığı (p=0,015) ve kırsal kesimden gelen hasta sayısının istatistiksel olarak anlamlı olarak azaldığı (p=0,023) saptandı. Girişimsel ya da medikal tedavi yaklaşımlarında istatistiksel anlamlı bir fark olmadığı görüldü (p=0,28). İki dönemde de hiç komplikasyon görülmedi.

Sonuç: COVID-19 pandemisi ürolojik acil başvurularının, kırsal kesimden gelen hasta oranının ve hastanede kalış süresinin azaldığı bir süreçtir.

Anahtar Kelimeler: COVID-19, koronavirüs, pandemi, üroloji, aciller

Introduction

Emergencies are departments where uninterrupted health services are provided for 24-hour. Urologists can be consulted for opinions when required within the scope of a multidisciplinary approach. Conditions among urologic pathologies such as renal colic, acute urinary retention, acute scrotum, hematuria, urogenital trauma, and urinary system infections make up the most frequent reasons for applications to emergencies[1].

Urological cases make up a small percentage among all applications in general emergency practice. Akıncı[2] conducted a study during which the ratio of urologic cases among all emergency applications was reported as 2.67%. However, it is indicated that the patient population applying for emergencies may change during special circumstances and that emergencies can be affected differently from such circumstances[3].

Coronavirus disease-2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus-2 was first detected in Wuhan state of China in December 2019[4]. The disease with symptoms such as fever, coughing, dyspnea, and myalgia may result in death by causing multiple organ dysfunction such as acute heart damage, acute kidney failure, and acute respiratory distress syndrome[5]. The virus spread globally within 3 months after the first case, causing 120.000 cases and 4.200 deaths during this period. Hence, it was declared as a global pandemic by the World Health Organization (WHO) on March, 11 2020[6]. This date when the disease was declared as a global pandemic was also the date when the first case was detected in Turkey[7]. Certain measures were put into practice in Turkey along with the world within the scope of the fight against the pandemic. Permanent lookdown for individuals aged below 20 and above 65, along with weekend lookdowns for individuals outside these groups, and long-distance travel restrictions is among these measures[8]. These restrictions ended on June 01, 2020, when the government gave permission for a gradual transition to social life, thus starting a new period in Turkey known as the "new normal".

It was reported in a study in China that about 2000 healthcare employes were infected during the first 2 months of the pandemic, which resulted in setbacks in healthcare services[9]. While health services are provided in all medical disciplines during the COVID-19 pandemic, there has been a need to move outside the standard practices and priorities have changed. Approaches to diseases have been revised by International Medicine Organizations aiming for the contact of healthcare personnel with the right patients by way of various regulations and suggestions. In this context, the European Association of Urology published a special guideline for reducing the potential impacts of COVID-19 disease on both urology patients and healthcare employes providing urological care services. Necessary changes that should be made in daily urology practices have been identified with this guideline. Diseases that should be treated during this period have been indicated along with diseases for which treatment can be postponed[10]. Even though the required arrangements for routine urology interventions have been put forth in the guidelines, it has not been possible to predict how urology cases in emergencies will be affected by this process, thus resulting in a gap in the literature.

The present study evaluated the impacts of the COVID-19 pandemic on urological emergency application profiles and the approach to urological emergencies.

Materials and Methods

Study Design and Data Acquisition

Following the approval of the Aydın Adnan Menderes University Ethics Committee (protocol no: 2020/221, date: 19.11.2020), the data were scanned retrospectively for patients who applied to the emergency with urology consultation requirement during the March 11, 2020 (the data on which COVID-19 was declared as a pandemic by WHO and the date on which the first COVID-19 case was detected in Turkey) - June 01, 2020 (the date on which gradual transition to social life started) (COVID period) along with the data of patients aged ≥18 who applied during the dates of March 11, 2019-June 01, 2019 (non-COVID period). Data were recorded for the patients such as age, gender, time of application, reasons for application, prior emergency applications due to the same reason, treatment approach, comorbidities, hospitalization requirement, duration of hospitalization, places of residence, anticoagulant use and complication ratio. Patients without any urological pathology despite urological consultation and patients aged <18 were excluded from the study.

Since the age groups subject to restrictions by the state as part of the COVID-19 measures are <20 and ≥65, the patients were classified into 3 different age groups as <20, 20-64 and ≥65. Daytime and nighttime shift hours were taken as basis when determining the nighttime and daytime emergency applications (08.00-17.00 and 17.00-08.00). Procedures such as urethral catheter placement, cystostomy catheter placement, and nephrostomy catheter placement were considered as minor urological interventions, whereas procedures that should be performed under operating room conditions with anesthesia were considered as major urological interventions.

Statistical Analysis

After examining whether the data fit normal distribution or not, median values and interquartile ranges (IQR) were used for a statistical summary of the distribution between the groups. Mann-Whitney U test and Pearson chi-square test were used for the proper modeling of the relationship between the continuous and categorical variables. Fisher exact test was used for cases when the chi-square test was not suitable. Values of p less than 0.05 were accepted as statistically significant. All statistical analyzes were carried out using SPSS (Statistical Package for the Social Sciences) version 22.0 software (IBM Corp. Release 2013. IBM SPSS Statistics for Windows, Version 22.0. IBM Corp., Armonk, NY, USA).

Results

The total number of patients who applied to the emergency department during the non-COVID period was 14,538, while it was determined as 6,930 for the COVID period. A total of 90 patients (n=63 non-COVID, n=27 COVID) were included in the study after excluding 15 patients that did not meet the required criteria from among the 105 patients with urology consultation request. The median age of the patients was 56 for the non-COVID period and 63 for the COVID period (Table 1). However, no statistically significant difference was observed between the two groups (p=0.32). It was observed when the applications were examined subject to age groups that the most frequent applications were for the 20-64 age group (n=30, 47.6%) during the non-COVID period, while patients aged ≥65 (n=13, 48.1%) applied more frequently during the COVID period. However, the difference between the groups was not statistically significant (p=0.624). A total of 40 male and 23 female patients applied during the non-COVID period, whereas 21 male and 6 female patients applied during the COVID period. The gender distributions between the groups were similar (p=0.184). The majority of the patients applied during the night shift in both periods (non-COVID n=36 57.1%, COVID n=17 63%), (p=0.60). While renal colic was the most frequently encountered reason for application during the non-COVID period (n=28, 44.4%), acute urinary retention (n=10, 37%) was observed more frequently during the COVID period. However, this difference was not statistically significant (p=0.194). It was observed in both periods that majority of the patients were those without a history of application to the emergency with the same complaints (non-COVID n=35 55.6%, COVID n=14 51.9%) (p=0.746).

Medical treatment was applied in the majority of the patients who applied during both periods (non-COVID n=36 57.2%, COVID n=11 40.7%). However, minor urological intervention was applied in 21 patients (33.3%) during the non-COVID period and major urological intervention was applied in 6 patients (9.5%). These numbers for the COVID period were 11 (40.7%) and 5 (18.6%) respectively. No statistically significant difference could be observed between the two groups about these interventional procedures (p=0.28). It was observed in both periods that the number of patients with at least one comorbidity was greater than those without any comorbidity (non-COVID n=32 50.8%, COVID n=18 66.7%) (p=0.247).

Table 1. Characteristics of patients

Variable[a]	Period		P value[b]
	Non-COVID (n=63)	COVID (n=27)	
Age	56 (23-73)	63 (29-79)	0.32
Age groups			
<20	9 (14.3)	4 (14.8)	0.624
20-64	30 (47.6)	10 (37)	
≥65	24 (38.1)	13 (48.1)	
Gender			
Male	40 (63.5)	21 (77.8)	0.184
Female	23 (36.5)	6 (22.2)	
Time of application			
Day	27 (42.9)	10 (37)	0.60
Night	36 (57.1)	17 (63)	
Reason for application			
Acute urinary retention	9 (14.3)	10 (37)	0.194
Hematuria	14 (22.2)	3 (11.1)	
Renal colics	28 (44.4)	9 (33.3)	
Scrotal pain	3 (4.8)	2 (7.4)	
Trauma	5 (7.9)	3 (11.1)	
Priapism	3 (4.8)	0 (0)	
Urinary incontinence	1 (1.6)	0 (0)	
The type of application			
People that came first time	35 (55.6)	14 (51.9)	0.746
People that came before	28 (44.4)	13 (48.1)	
Treatment approach			
Medical treatment	36 (57.2)	11 (40.7)	0.28
Minor urological intervention	21 (33.3)	11 (40.7)	
Major urological interventions	6 (9.5)	5 (18.6)	
Comorbidity			
Yes	32 (50.8)	18 (66.7)	0.247
No	31 (49.2)	9 (33.3)	
Decision			
Outpatient treatment	52 (82.5)	21 (77.8)	0.597
Hospitalization	11 (17.5)	6 (22.2)	
The duration of hospitalization	5 (2-10)	1.5 (1-4)	**0.027**
Place of residence			
City center	19 (30.2)	15 (55.6)	**0.023**
Rural area	44 (69.8)	12 (44.4)	
Anticoagulant use			
Yes	9 (14.3)	10 (37)	**0.015**
No	54 (85.7)	17 (63)	
Complication			
Yes	0 (0)	0 (0)	-
No	63 (100)	27 (100)	

[a]Median (25^{th}-75^{th} percentile) for continuous variables, number (%) for categorical variables

[b]Mann-Whitney U test for continuous variables, Pearson chi-squared test for categorical variables

Outpatient treatment (non-COVID n=52 82.5%, COVID n=21 77.8%) and hospitalization (non-COVID n=11 17.5%, COVID n=6 22.2%) ratios were similar for the patients (p=0.597). However, while the median hospitalization duration was 5 days during the non-COVID period, it was observed as 1.5 days during the COVID period (p=0.027). Patients who applied during the non-COVID period were mostly living in rural areas. However, this ratio decreased statistically significantly during COVID period (non-COVID n=44 69.8%, COVID n=12 44.4%) (p=0.023).

A comparison of the application ratios about anticoagulant use showed that the ratio of patients using anticoagulants was greater during the COVID period (n=10, 37%) compared with the non-COVID period (n=9, 14.3%) (p=0.015). Although anticoagulant use is a risk factor for urological interventions, no complications were observed in any of the patients during the interventions carried out in both periods.

Discussion

The COVID-19 pandemic that changed almost all areas of life also had an impact on urology practice while interventions were permitted only for emergencies in some regions subject to the prevalence of the pandemic, interventions were continued on elective cases in some regions[11]. Soytaş et al.[12] conducted a study during the pandemic in which it was reported that the patient profile did not change in "elective" urology practice; but that there was a statistically significant decrease in the number of patients who applied to the hospital compared with the period before the pandemic. The limitations imposed on polyclinic services in many hospitals due to the COVID-19 pandemic made it difficult for patients with non-emergency urological complaints to have access to urologists.

Similarly, the number of patients and patient populations in emergencies also changed after the pandemic. It has been observed as a result of a study on emergency applications that there was a statistically significant decrease in the number of patients compared with the pre-pandemic period but that the mortality rates in emergencies increased[3]. Another study has illustrated a decrease in the number of cerebrovascular and cardiovascular cases applying to the emergency[13]. Motterle et al.[14] carried out a study during the first days of the pandemic because of which a decrease was reported in the number of patients who applied to emergencies with urology complaints. A significant decrease of about 58% was observed in our study in the number of urology cases that applied to the emergency compared with the same period of the previous year. This decrease was thought to be related to the concern of patients related to the increasing risk of contagion at hospitals. Moreover, the limitation of patient access due to procedures such as lookdowns and travel restrictions was also considered as a crucial factor for this decrease in our tertiary healthcare institution serving a wide geographical region.

Motterle et al.[14] observed in their study that the mean age of urology patients who applied to the emergency department during the COVID period was higher compared with the pre-pandemic period. On the other hand, no statistically significant difference was not observed between the periods in our study. Moreover, it was put forth because of our study that majority of the patients who applied to the emergency were aged ≥65 even though this did not result in a statistically significant difference. The fact that patients aged ≥65 formed the majority in emergency applications despite the pandemic restrictions they are faced with was considered resulting from the necessity to apply to emergencies due to increased number of comorbidities.

Madanelo et al.[15] carried out a study in which a statistically significant decrease was observed in the number of female patients who applied for emergency urology complaints during the COVID period. However, no statistically significant difference was observed between the periods during Novara et al.[16]. Our data were in accordance with those of Novara et al.[16], and a statistically significant difference was not observed between the periods. Male applications made up the majority in our study during both periods. This majority is thought to be due to the fact that genital system pathologies are considered among emergency pathologies of the urinary system in men, contrary to women.

Motterle et al.[14] reported in their study that the number of daytime applications was higher in both period. On the contrary, it was observed that the number of nighttime applications was higher in our study during both periods.

Novara et al.[16] performed a study during which it was observed that majority of the patients in the non-COVID period had previously applied to the emergency with the same complaints, while it was identified that majority of the patients in the COVID period were patients applying to the emergency for the first time. In this study, more than half of the patients in both periods were individuals who applied to the emergency department for the first time with these symptoms. Madanelo et al.[15] highlighted an increase in the number of cases requiring surgery despite the decrease in

the number of patients during the COVID period. Surgical intervention was not required for the majority of patients in our study during both periods. Motterle et al.[14] determined an increase in the hospitalization requirement of patients who applied during the COVID period. Hospitalization was not required during both periods for the majority of the patients in our study. The patients were sent home after arranging their treatment plans.

On the other hand, the hospitalization durations were shorter during the COVID period compared with the non-COVID period, even when hospitalization was required This was considered to be due to the efforts to discharge the patients as soon as possible in order to reduce the patient load of the hospital during the pandemic as well as to reduce the risk of contamination.

Topaktaş et al.[17] conducted a study in 2013 in which it was reported that 41.2% of the urologic emergencies were urinary system infections. This was followed by renal colic with 36.9% and acute urinary retention in the third place with 9.3%. While in our study renal colic was ranked first during the non-COVID period with 28 patients (44.4%), it was observed that acute urinary retention was ranked number one during the COVID period with 10 patients (37%). However, this change in rankings did not make a statistically significant change in the general population. Contrary to our study, two previous studies on urologic emergencies during the COVID period stated differences between the reasons for application during the periods[14,16]. Another interesting finding of our study was the fact that urinary infection cases that comprise an important percentage among urologic emergencies were not consulted.

It was observed in our study that more than half of the patients had comorbidity in both periods. This was considered to be mainly because the majority of the urology patients comprised middle aged and older patients. On the other hand, anticoagulant use was also frequently among patients who applied during the clinical period. anticoagulant use is a risk factor for surgical interventions[18]. However, no hemorrhage or complications were observed in any of the 43 patients who were subjected to minor or major urological interventions in our study.

It was observed in our study that 69.8% of the patients who applied during the non-COVID period were living in rural areas, while this percentage decreased to 44.4% during the COVID period. This was considered to be because individuals in rural areas do not prefer hospitals in urban areas since the COVID-19 pandemic had a greater impact on larger cities in addition to their obligation to apply to local healthcare institutions due to travel restrictions.

As far as we know, our study is the most comprehensive study in the literature evaluating the impact of the COVID-19 pandemic on urology emergency applications. There are 3 publications in the literature that partially focus on this subject[14-16]. Similarly, the studies include groups with some patients. All these studies were conducted during the first days of the pandemic, with the study having the longest period of evaluation covering data for 36 days[14]. This was the period when people were just starting to perceive the pandemic, and it was way too short to examine patient behaviors. In addition, the end times of the studies were determined randomly. No standardized period was identified as the study period, and the studies were finalized on random dates. Thus, it was considered that the results of the other studies will not be able to provide a complete knowledge of "periods". Our study was conducted starting from the day of the first case in Turkey covering the entire 82-day "first wave" period including the first stage during which the pandemic was tried to be controlled in Turkey. Thus, it was considered that our study will provide more accurate information on the results of the pandemic since it reflects a limited period of time during which lifestyle was changed with legal regulations. On the other hand, previous studies were conducted in Italy, which was the first country in Europe that was affected by the pandemic. The unexpected increase in the number of patients during the first periods of the pandemic forced the healthcare system almost to a point of collapse[19]. This was considered to result in a limitation in evaluating the profile and treatment approach for urology emergencies.

Study Limitations

The retrospective design and small number of patients can be considered as the limitations of our study. The fact that Turkey is located at a relatively lower risk region during the first stages of the pandemic may be considered as a factor affecting our patient profile. In addition, our study covers only the first stage of the pandemic. In the later stages of the pandemic, there may have been differences in emergency service practices as the perspective of patients and government on the disease changed. Multicenter studies including different risk regions may provide an opportunity for a more objective evaluation.

Conclusion

The COVID-19 pandemic is a period during which the number of urological emergencies decreased but with no pandemic-related changes in treatment approaches. However, there has been a decrease in the rate of patients from rural areas applying and hospitalization time. The fact that this can change with the intensity of the pandemic should be considered when planning emergency healthcare services including urology emergencies.

Ethics

Ethics Committee Approval: The study was approved by the Aydın Adnan Menderes University Ethics Committee (protocol no: 2020/221, date: 19.11.2020).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: H.G.K., A.E.Y., A.A., Concept: H.G.K., A.K., E.A., Design: H.G.K., A.K., E.A., Data Collection or Processing: H.G.K., A.E.Y., A.A., Analysis or Interpretation: H.G.K., A.K., E.A., Literature Search: H.G.K., A.E.Y., A.A., Writing: H.G.K., A.K., E.A.

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