



Evaluation of urological emergency cases admitted to emergency department

Acil servise başvuran ürolojik acil olguların değerlendirilmesi

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Abstract

Background: Especially in recent years, with the increase in the number of patients admitted to the emergency services the number of urological emergencies is increasing. Some of these require immediate attention. There are not enough studies on urological emergencies in our country. In this study, we aimed to investigate the demographic data of patients over the age of 18 who presented to the emergency department with non-traumatic urological emergency complaints.

Methods: This study was designed based on a 6-month prospective, cross-sectional study. After obtaining the approval of the ethics committee, patients over the age of 18 with urological emergency complaints were examined between 06.11.2019 and 06.05.2020.

Results: The ratio of urological emergencies to all patients was found to be 1.5%. 56.76% (n=231) of the patients were male and 43.24% (n=176) were female. In the study was found 44.7% of the patients to be urinary tract infection, 31.45% renal colic, 8.8% hematuria, 6.88% acute urinary retention. In our study, urology consultation was requested for 19% of urological emergency patients. Emergency intervention was applied to 21.13% of all urological emergency cases. Emergency operation was required for 1.47% of the patients. 10.81% of the patients required hospitalization.

Conclusion: As a result, urological emergencies are common. Among these cases, there may be diseases that require urgent intervention or surgery. It is very important for the patients the emergency physicians who evaluate the patient first to make a careful and meticulous evaluation and to make a urology consultation if necessary.

Keywords: Renal colic, urinary tract infection, urological emergency.

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Öz

Amaç: Özellikle son yıllarda acil servislere başvuran hasta sayısının da artmasıyla ürolojik acil olguların da sayısı gün geçtikçe artmaktadır. Bunlardan bazıları acil müdahale gerektirir. Ülkemizde yeteri kadar ürolojik aciller ile ilgili çalışma yoktur. Bu çalışmada acil servise travma dışı ürolojik acil şikâyetlerle başvuran 18 yaş üstü hastaların demografik verilerini incelemeyi planladık.

Yöntemler: Çalışma 6 aylık prospektif, kesitsel araştırmaya dayanarak tasarlandı. Etik kurul onayı alındıktan sonra bir üniversite hastanesi acil servisine 06.11.2019 ile 05.06.2020 tarihleri arasında başvuran ürolojik acil şikâyetleri olan 18 yaş üzeri hastalar incelendi.

Bulgular: Ürolojik acil hastaların tüm hastalara oranı %1,5 olarak saptandı. Hastaların %56,76 (n= 231)'si erkek, %43,24 (n=176)'ü kadın olarak saptandı. Çalışmada hastaların %44,7'si idrar yolu enfeksiyonu, %31,45'si renal kolik, %8,8'i hematüri, %6,88'i akut üriner retansiyon, olarak saptanmıştır. Çalışmamızda ürolojik acil hastaların %19'una üroloji konsültasyonu istenmiştir. Tüm ürolojik acil olguların %21,13'üne acil girişim uygulanmıştır. Hastaların %1,47'sine acil operasyon gerekmiştir. Hastaların %10,81'ine servis yatışı gerekmiştir.

Sonuç: Sonuç olarak, ürolojik acil olgulara sık rastlanmaktadır. Bu olgular arasında acil girişim veya operasyon gerektiren hastalıklar olabilir. Hastayı ilk değerlendiren acil servis hekimlerinin dikkatli ve titiz bir değerlendirme yapması, gerekirse üroloji konsültasyonu istemesi oldukça önemlidir.

Anahtar Kelimeler: Renal kolik, idrar yolu enfeksiyonu, ürolojik acil.

Introduction

Many patients apply to emergency department (ED) with urological problems. Especially in recent years, with the increase in the number of patients admitted to emergency services, the number of urological emergencies is increasing day by day. In a study conducted in Turkey, the ratio of urological emergencies admitted to the emergency service to all admissions was found to be 2.67% [1]. Some of these require immediate attention and are classified as urological emergencies. Urological emergencies can be classified as urinary tract infections (UTI), renal colic due to urinary system stone disease, acute urinary retention, hematuria, testicular torsion, Fournier's gangrene, postrenal occlusive conditions, epididymitis-orchitis and priapism. Among these, the most common ones are renal colic due to UTI and stone disease. Along with these, macroscopic hematuria, acute urinary retention, postrenal occlusive conditions, scrotal pathologies are common. Recognition of these diseases and timely correct intervention are very important in terms of morbidity and mortality of the patients [2, 3].

Hematuria can be defined as the appearance of red blood cells in the urine [4]. The frequency of admission to the hospital with the complaint of hematuria in the community varies between 2% and 31% [5]. It is clinically divided into two types as macroscopic hematuria and microscopic hematuria.[6]. Acute urinary retention (AUR) is one of the urological emergencies that is characterized by sudden onset of voluntary urination, frequent and dripping urination and painful bladder. It is mostly seen in older men. 10% of 70-year-old men and approximately 33% of 80-year-olds experience urinary retention at least once in their lifetime [7, 8].

Renal colic is one of the most common urological emergencies in ED with severe pain, which usually develops due to urinary system stone disease. The pain is typically felt as blunt and aching at the cost-vertebral angle [9,10]. Fournier's gangrene is a rare necrotizing fasciitis that affects the perineal, perianal or genital regions, with a high mortality rate. The mortality rate is high and requires early surgical treatment [11]. Clinical findings include fever, sudden onset pain with chills, edema, crepitation, and necrosis. The clinic may worsen rapidly and is accompanied by hypotension, general condition deterioration [12]. Testicular torsion is an emergency situation in which the blood supply of the testis is impaired as a result of the rotation of the spermatic cord around itself, and accordingly testicular ischemia occurs [13]. Priapism is defined as a prolonged erection that develops uncontrollably without sexual stimulation and cannot be terminated by ejaculation. It is a urological emergency because it may cause permanent erectile dysfunction and necrosis in penile tissue if early treatment is not initiated [14, 15]. Epididymitis and orchitis are defined as infection or inflammatory reaction of the epididymis and testis due to infection, local trauma or previous surgery. There is an underlying genitourinary anomaly or an infectious disease in the etiology. Fever, pain, and scrotal swelling are often present. Inflammation lasting longer than 6 weeks results in chronic epididymitis or orchitis [16, 17]. Postrenal acute renal failure (ARF) occurs after obstruction in the urinary tract. It can be caused by any stenosis in the renal pelvis, ureter, bladder, prostate, and urethra. The primary cause of urinary tract obstruction is benign prostatic hypertrophy (BPH) [18].

In this study, we planned to examine the demographic data of patients with non-traumatic urological emergencies who applied to a university hospital emergency department in a 6-month period between November 2019 and April 2020.

Material and methods

Our study was conducted as a 6-month prospective, cross-sectional study after the approval of the ethics committee dated 06/11/2020 and numbered 170623. Patients over the age of 18 who applied to a University Medical Faculty Emergency Service between 06.11.2019 and 06.05.2020 with urological emergency complaints were examined. The written informed consent was taken from the patients.

The subjects included in the study were age, gender, vital signs, presenting complaint (flank pain, burning in urine, blood in urine, darkening in urine, discharge, inability to urinate, testicular pain, inguinal pain, abdominal pain, fever), examination findings (suprapubic tenderness, CVAT), macroscopic hematuria, pyuria, testicular tenderness), laboratory examinations (WBC, CRP, platelet, urea, creatinine, aptt, INR, complete urine analysis), additional urological diseases, treatments (medical, emergency intervention, surgery) and recent conditions (discharge, hospitalization), were examined and recorded in the forms.

Patients who applied for hematuria only with the complaint of bleeding in the urine were included in the study. Patients with erythrocytes in laboratory urinalysis were not included in the study.

Patients under the age of 18, trauma patients, patients whose consent could not be obtained, and patients who left the hospital without permission without waiting for results were excluded from the study.

Statistical Analysis

IBM SPSS Statistics for Microsoft 22.0 (SPSS Inc, Chicago, United States of America) program was used for statistical analysis of our data. The Student-t test was used to compare the normally distributed quantitative data between the two groups, and the Mann-Whitney U test was used to compare the non-normally distributed quantitative data between the two groups. Fisher's exact and Pearson chi-square tests were used to compare qualitative data. When comparing three or more groups, the One-Way Anova test was used, and if the group variances were similar as post-hoc tests, Tukey-HSD; If group variances were different, Games-Howell tests were used.

Results

The study was conducted with 407 patients over the age of 18 who applied with urological emergency complaints and were accepted as urological emergencies. Of these patients, 56% (n=231) were male and 43% (n=176) were female. Compared to all applications, the rate of urological patients was found to be 1.5% in our study, while the rate of male patients was 0.80% and the rate of female patients was 0.65%. The ages, vital signs and laboratory parameters of the patients are shown in Table 1.

In our study, 181 of the patients were found to be UTI, 128 renal colic, 36 hematuria and 28 AUR, 36 hematuria, 13 epididymoorchitis and 6 post-renal ARF. In our study, hospitalization was provided for 3 patients with the diagnosis of Fournier's gangrene requiring emergency operation. UTI (0.67% of all cases and 44.47% of urological emergencies) and renal colic (0.47% of all admissions and 31.45% of urological cases) were found most frequently in urological emergencies.

Considering the examination findings of the patients included in the study, the most common examination finding in UTIs was tenderness in the suprapubic region in 56 patients (UTI rate 30.9%). Nine of the patients had tenderness in the lower quadrants of the abdomen. Pyuria was detected in 10 patients. Macroscopic hematuria was detected in all patients presenting with hematuria. Suprapubic tenderness was present in 27 of the patients with AUR.

Table 1. Evaluation of age, vital signs and laboratory parameters of the patients included in the study by gender

	Gender		P
	Male	Female	
Age (year) †	51.65±19.99 20.00-95.00	44.84±19.80 18.00-104.00	0.001**
SBP (mmHg) †	139.38±24.86 88.00-237.00	132.14±21.85 83.00-212.00	0.002**
DBP (mmHg) †	83.61±16.80 52.00-159.00	81.09±14.38 52.00-137.00	0.111
MAP †	102.20±17.94 64.00-175.67	98.11±15.29 69.67-154.67	0.016*
Pulse (beats/min) †	87.85±18.52 48.00-190.00	88.94±16.00 53.00-153.00	0.533
Fewer (°C) †	36.48±0.84 26.50-40.00	36.43±1.55 16.70-38.00	0.675
SpO ₂ (%) †	96.94±2.07 87.00-100.00	96.97±2.00 90.00-100.00	0.880
WBC (x10 ³ /mm ³) †	9.65±3.39 2.10-21.00	9.07±3.18 0.90-18.20	0.116
NEUT (x10 ³ /mm ³) †	6.87±3.39 1.30-19.10	6.41±3.10 0.20-16.40	0.205
HGB (g/dl) †	13.27±2.37 3.20-17.20	12.00±1.75 3.40-16.20	<0.001**
PLT (x10 ³ /mm ³) †	256.53±83.79 62.00-594.00	270.60±85.47 42.00-617.00	0.134
Urea (mg/dl) †	44.24±30.48 15.00-237.00	34.58±22.33 8.00-151.00	0.001
Creatinine (mg/dl) †	1.30±1.04 0.34-7.40	0.92±0.85 0.40-7.59	<0.001**
Potassium (mmol/l)	4.34±0.50 3.10-6.00	4.31±0.52 3.40-6.40	0.669
CRP (mg/l) †	38.31±79.55 0.30-498.00	28.87±59.72 0.10-481.00	0.235
Urine pH †	5.87±0.67 5.00-8.00	6.14±0.72 5.00-8.00	0.001**

†: mean±standard deviation, (min-max),

MAP = mean arterial pressure; SpO₂=oxygen saturation; SBP=systolic blood pressure; DBP= diastolic blood pressure; WBC=white blood cell; NEUT=neutrophil; HGB= hemoglobin; PLT=platelet; CRP= C-reactive protein.

In half (n=3) of the patients with post-renal ARF, the examination finding was CVAT and the examination finding was suorapubic tenderness in two of them. Considering that the most common cause of post-renal ARF is urinary calculus or urinary tract obstruction due to post-renal pathologies, the examination findings in our study support the diagnosis.

CVAT was detected in 108 (84.3% renal colic rate and 26.5% within-study rate) of 128 patients diagnosed with renal colic. Eighteen of the patients diagnosed with renal colic had tenderness in the lower quadrants.

Urology consultation was required for 78 of the 407 patients included in the study. Patients for whom urology consultation was requested constituted 19.1% of the patients included in the study. Urology consultation was required in 0.28% of the total ED patients who applied for a 6 months of period. Of the patients for whom urology consultation was requested, 63 were male and 15 were female. Male patients comprised 80.7% of

the patients for whom urology consultation was requested. Emergency intervention was performed in 86 of the patients and emergency operation was required in six of them. Patients who underwent emergency intervention constituted 21.13% of all urological emergencies. Of the patients who underwent intervention, 74 were male and 12 were female. In total, 78 patients had a Foley catheter, four patients had a double-J catheter, 3 patients could not be inserted and suprapubic catheterization was inserted. Percutaneous nephrostomy was performed urgently in onr patient included in the study.

All of the six patients who needed surgery were male patients. Urology consultation was required in eight of 181 patients diagnosed with UTI. Urology consultation was required in 13 of the patients diagnosed with renal colic, in 21 of the patients presenting with hematuria, and in 13 of the patients presenting with AUR. The diseases requiring the most urology consultation were hematuria and AUR. Urology consultation was required in 5 of 6 patients with post-renal ARF.

The distribution of urology consultation, intervention and operation according to the diagnosis of the patients are shown in Table 2.

In our study, 10.81% (n=44) of 407 patients who applied to ED required ward admission. The remaining 363 patients were discharged from the ED. When the patients were examined according to gender, 34 of 44 patients admitted to the ward were male and 10 were female. In our study, it was determined that 19% (n=78) of urological emergency patients required urology consultation and 10.81% of them required service admission.

Considering the diagnoses, the highest number of hospitalizations was UTI with 17 patients. All six patients with post-renal ARF required hospitalization. Of the 36 patients who presented with hematuria, 8 were hospitalized and 28 were treated and discharged from the ED. The distribution of the patients according to their diagnosis and hospitalization or discharge is shown in Table 3.

Discussion

Urological emergencies constitute 51.87% of all cases. The most common urological emergency disease was found to be UTI with 51.74%. The rate of renal colic was found to be 27.68% and is similar to our study. In the same study, the rate of macroscopic hematuria was found to be 2%. Compared to the study of Kafkaslı et al. [2], the rate of hematuria was found to be higher in our study. While the patients requiring urology consultation in the study were 9.07% of all cases, this rate was found to be 19% in our study. In the same study, the rate of patients who underwent emergency urological intervention was found to be 6.14%.

In the study performed by Akıncı et al. [1], the ratio of urological emergencies to all cases was 2.67%. The most common urological emergency is UTI, followed by renal colic and acute urinary retention. The rate of UTI was 54.15% and renal colic was 33.1%, which is similar to our study. The rate of acute urinary retention is 7.97%, which is similar to the rate of AUR in our study. In the same study, 9.05% of the patients required urology consultation. 8.83% of the patients were treated as inpatients. In our study, hospitalized patients had similar rates with this study. In our study, the rate of patients requiring consultation was found to be higher. It is estimated that the reason for the high rate of urology consultation in our study is that our hospital is a 3rd level hospital and they were sent from another hospital for consultation. In the study of Akıncı et al. [1], the number of patients who underwent intervention was found to be 1.76% and it is similar to our study.

Table 2. Distribution of consultation, intervention and operation according to the diagnosis of the patients.

	Urology Consultation		Intervention		Operation	
	yes	no	yes	no	yes	no
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Urinary tract infection (n=181; 44.47%)	173 (42.51)	8 (1.97)	164 (40.29)	17 (4.18)	181 (44.47)	0 (0)
Renal colic (n=128; 31.45%)	115 (28.26)	13 (3.19)	125 (30.71)	3 (0.74)	128 (31.45)	0 (0)
Hematuria (n=36; 8.85%)	15 (3.69)	21 (5.16)	10 (2.46)	26 (6.39)	36 (8.85)	0 (0)
Acute urinary retention (n=28; 6.88%)	15 (3.69)	13 (3.19)	0 (0)	28 (6.88)	28 (6.88)	0 (0)
Epididymoorchitis (n=13; 3.19%)	7 (1.72)	6 (1.47)	12 (2.95)	1 (0.25)	13 (3.19)	0 (0)
Acute renal failure (n=6; 1.47%)	1 (0.25)	5 (1.23)	1 (0.25)	5 (1.23)	6 (1.47)	0 (0)
Other (n=15; 3.69%)	3 (0.74)	12 (2.95)	9 (2.21)	6 (1.47)	9 (2.21)	6 (1.47)

Table 3 Hospitalization or discharge of patients according to their diagnosis.

	Gender		Outcome	
	Male	Female	Hospitalization	Discharge
	n (%)	n (%)	n (%)	n (%)
Urinary tract infection (n=181; 44.47%)	67 (16.46)	114 (28.01)	17 (4.8)	164 (40.29)
Renal colic (n=128; 31.45%)	77 (18.92)	51 (12.53)	4 (0.98)	124 (30.47)
Hematuria (n=36; 8.85%)	31 (7.62)	5 (1.23)	8 (1.97)	28 (6.88)
Acute urinary retention (n=28; 6.88%)	27 (6.63)	1 (0.25)	2 (0.49)	26 (6.39)
Epididymoorchitis (n=13; 3.19%)	13 (3.19)	0 (0)	1 (0.25)	12 (2.95)
Acute renal failure (n=6; 1.47%)	4 (0.98)	2 (0.49)	6 (1.47)	0 (0)
Other (n=15; 3.69%)	12 (2.95)	3 (0.74)	6 (1.47)	9 (2.21)

In a study by Talreja et al. [19], urological emergencies were examined among surgical admissions and urological emergencies were found to be 5.84% of all surgical emergencies. In our study, our results were found to be low because emergency applications were not divided into surgical emergencies and internal medicine. In the same study, the most common reason for admission was found to be renal colic with a rate of 24.17%. This result is similar to the rate of renal colic in our study.

In a study by Traore et al. [20], urological emergencies constitute 3.7% of all cases. This rate was found to be similar in our study. The most common urological emergency was found to be AUR with 48.28%. The rate of UTI was 19.92% and the rate of renal colic was 11.49%, which was lower than our study. The fact that the frequency of presentations varies according to studies may be evidence that urological emergencies vary according to the region. Their study was conducted in a hospital in Africa and our

study was conducted in Europe. In the study of Bah and Diallo [21] in Guinea, the rate of AUR was reported as 73.9%. In the study of Ndiaye M et al. [22], the most common urological emergency was hematuria with a rate of 25.6%. The rate of AUR is seen in the second frequency with 21.6% and it was found to be higher than in our study. At the same time, the rate of UTI was found to be lower with 19% than in our study.

In the study of Topraktaş R. et al. [23], the rate of urological emergencies was found to be 2.19%, which is similar to our study. In the study conducted by Girgin R. et al. [24] to evaluate urological emergencies, the frequency of urological emergencies was found to be 0.39%. In the study, the most frequent application was evaluated as renal colic with 25.5% and it is close to our study. However, the rate of UTI was found to be 6.3% and it was found to be quite low compared to our study. In the same study, 15.5% of the patients required intervention. In the study, the frequency of AUR was found to be 10.6%, which was higher than in our study [23,24].

Renal colic is one of the most common urological emergencies, which is the reason for frequent admission to emergency services. In our study, it was found to be the second most common urological disease. In the USA, there are approximately 2 million applications for renal colic to emergency services annually [25]. Renal colic usually develops due to urinary system stone disease and the most common age range is male patients aged 20-50 years. Acute renal colic treatment is usually performed by ED doctors [2].

AUR usually occurs in male patients with BPH and its treatment is urinary catheterization. In the study of Fall et al. [26], the rate of AUR was reported as the most common urological emergency with a rate of 53%. In the study of Traore et al. [20], the most common urological emergency was found to be AUR with a rate of 48.28%. In the study of Girgin R. et al. [24], the frequency of AUR was reported as 10.6%. In this study, the rate of urethral catheterization was reported as 24.9% and the rate of percutaneous cystostomy (suprapubic catheterization) was reported as 4.89%. The results of our study are similar to this study [24].

Urinary system catheterization and percutaneous cystostomy are frequently performed interventions in emergency departments. Urethral catheter is usually inserted by emergency physicians. Percutaneous cystostomy may be required in patients in whom urethral catheterization cannot be performed. Fall et al. [26] reported the incidence of percutaneous cystostomy as 59.8% in their study. In the study of Topraktaş et al. [23], patients who underwent percutaneous cystostomy were reported as 22.3% of all cases. In our study, it was found that patients who underwent percutaneous cystostomy were lower than in other studies.

Macroscopic hematuria causes anxiety in patients and causes admission to ED. The important thing in the ED is the hemodynamic stability of the patient. In addition, considering that hematuria may cause urinary retention by forming a clot in the bladder, a catheter should be inserted and irrigation should be performed if necessary. In the study of Girgin R et al. [24], 30.8% of patients with hematuria were hospitalized. In the study of Fall et al. [26], the frequency of hematuria was reported as 7.1% [24]. In the study of Traore et al. [20], the rate of hematuria was found

to be 7.28%, and the rate of hematuria was found to be similar with our study.

Due to the COVID-19 pandemic in the world at the end of 2019 and in 2020, health institutions and especially the functioning of ED has changed in our country as well as all over the world. Since the beginning of the epidemic in Turkey in March, the number of patients admitted to the ER of our hospital, where we worked in the early days, has decreased considerably. In the 36-day study of Motterle et al. [27] in Italy in 2019 and 2020, on patients who underwent urology consultation during COVID-19, 287 urology consultations were reported in the same period in 2019, this number was 109 urology consultations during the COVID-19 epidemic period in 2020.

In the comparative study of Madanelo M. et al. [28] in 2019 and 2020 on urological emergencies of the COVID-19 epidemic, it was found that ED applications from urological emergencies were lower in the COVID-19 period.

In conclusion, urological emergencies are common. Among these cases, there may be diseases that require urgent intervention or operation. If the emergency physicians who first evaluate the patient in the ED should make a careful and meticulous evaluation, it is very important for the patient to make a urology consultation.

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