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The impact of the COVID-19 pandemic on the treatment of emergency urological patients during lockdown – Serbian tertiary center experience

Утицај пандемије КОВИД-19 на лечење ургентних уролошких пацијената током карантина – искуство терцијарног центра у Србији

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The impact of the COVID-19 pandemic on the treatment of emergency urological patients during lockdown – Serbian tertiary center experience

Утицај пандемије КОВИД-19 на лечење ургентних уролошких пацијената током карантина – искуство терцијарног центра у Србији

SUMMARY

Introduction/Objective The COVID-19 pandemic affected the functioning of health care systems, including emergency services worldwide. The aim of this study was to examine the impact of the pandemic and lockdown on the care of urgent urological patients in daily practice.

Methods Data were retrospectively collected from patients urgently hospitalized at Emergency Department of Clinic of Urology, University Clinical Center of Serbia, during the first three months of lockdown between Mar 15, 2020 and Jun 15, 2020, and compared to the same period in 2019. The collected data included demographic and clinical characteristics, as well as treatment characteristics and treatment outcomes.

Results This study included 80 patients who were hospitalized during the lockdown in 2020 and 68 patients who were hospitalized in the same period in 2019. There was no difference in total number of hospitalized patients, age and gender comparing these two periods. Among patients with urinary tract infection, the number of patients with urosepsis was significantly higher in 2020 (p = 0.028). The median time from symptoms onset to hospitalized in 2020 (p = 0.028). The median time from symptoms onset to hospitalized in 2020 (p = 0.049). No difference was found in duration of hospitalization and characteristics of treatment between two periods. The number of deaths was significantly higher in 2020 (p = 0.034).

Conclusion During lockdown in Serbia, patients applied to the emergency urology service significantly later. Furthermore, a higher number of patients with urosepsis and a higher number of deaths among hospitalized patients were found during lockdown compared to the previous year.

Keywords: COVID-19; pandemic; lockdown; urological emergencies; urology

Сажетак

Увод/Циљ Пандемија ковида 19 има утицај на функционисање здравствених система широм света, укључујући и ургентне службе. Циљ овог рада био је испитивање утицаја пандемије и карантина на збрињавање ургентних уролошких пацијената у свакодневној пракси.

Методе Подаци су прикупљени ретроспективно од пацијената ургентно хоспитализованих на Одељењу ургентне урологије Клинике за урологију Универзитетског клиничког центра Србије, током прва три месеца карантина између 15. марта и 15. јуна 2020, године, и поређени су са истим периодом током 2019. године. Прикупљени подаци су обухватали демографске и клиничке карактеристике, као и карактеристике лечења и исходе лечења.

Резултати Ова студија је укључила 80 пацијената који су били хоспитализовани током карантина 2020. године и 68 пацијената који су били хоспитализовани у истом периоду 2019. године. Нисмо уочили разлику у укупном броју хоспитализованих пацијената, старости и полу поредећи ова два периода. Међу пацијентима са инфекцијом уринарног тракта, број пацијената са уросепсом је био значајно већи у 2020. години (р = 0,028). Просечно време од почетка симптома до хоспитализације је било значајно дуже код пацијената хоспитализованих у 2020. години (р = Нисмо уочили разлику у дужини 0,049). хоспитализације и карактеристикама лечења између ова два периода. Број смртних исхода је био значајно већи у 2020. години (*p* = 0,034).

Закључак Током карантина у Србији, пацијенти су се јављали у ургентну уролошку службу знатно касније. Даље, већи број пацијената са уросепсом и већи број смртних исхода међу хоспитализованим пацијентима је уочен током карантина у поређењу са претходном годином.

Кључне речи: ковид-19; пандемија; карантин; ургентна урологија; урологија

INTRODUCTION

Since the first case of pneumonia caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified in Wuhan, China, in December 2019, the disease has spread around the world in a few months. On March 11, 2020, the World Health Organization declared coronavirus disease 19 (COVID-19) a pandemic [1]. From there on, the COVID-19 pandemic has become a global challenge for health care systems in terms of

providing necessary treatment to both COVID-19 and non-COVID-19 patients with adherence to epidemiological measures and strict separation of these pathways. Given the limited capacity of health systems being faced with the growing demands in management of COVID-19 patients, it was necessary to adopt guidelines and prioritize the care of other diseases and conditions [2, 3]. However, reorganization of health systems with limited access to health care, numerous lockdown restrictions and other anti-pandemic measures parallel with fear of getting COVID-19 infection, altogether affected the number of emergency department patient visits [4, 5]. The first case of COVID-19 in Serbia was reported on March 6, 2020 [6]. Soon after, state of emergency was declared in the country and lockdown was introduced on March 15 [7, 8]. Implemented epidemiological measures included restriction to free movement affecting all persons, but especially those over 65 years old [7, 8]. Also, the functioning of the health system has changed.

During lockdown, initial examination, triage and testing for suspected COVID-19 patients were managed in primary care, while most of secondary and tertiary institutions were transformed in COVID-19 hospitals [9, 10]. Consequently, in Belgrade, among five emergency departments that were available for urgent urological conditions in pre-pandemic period, only the University Clinical Center of Serbia (UCCS), Clinic of Urology remained open to take care both of urgent and elective urological conditions of non-COVID patients from the beginning of the pandemic until today.

Since the previously published studies related to impact of COVID-19 on urological practice have mainly focused on the elective treatment, data on hospital care of urgent urological conditions during the COVID-19 pandemic are limited [2, 11, 12]. The findings of previous studies indicated the impact of the COVID-19 pandemic on the care of patients with other emergency conditions [13, 14].

Therefore, the aim of this study was to examine the impact of COVID-19 pandemic on routine work of Emergency Department in Clinic of Urology, UCCS, Belgrade and treatment outcomes of hospitalized patients during the first three months of lockdown in Serbia compared to the same period in 2019.

METHODS

This was single-center observational retrospective study focused to evaluate daily urologic practice during COVID-19 pandemic in Emergency Department of Clinic of Urology,

University Clinical Center of Serbia. Data were retrospectively collected from electronic and paper medical records of patients urgently hospitalized at Emergency Department during the first three months of lockdown, between Mar 15, 2020 and Jun 15, 2020 [7,8], as well as from patients urgently hospitalized at this department during the same period in 2019. The collected data included demographic and clinical characteristics, as well as treatment characteristics and treatment outcomes. The study has been approved by the Ethics Committee of the University Clinical Center of Serbia (number 602/5).

At time of diagnosis, all patient met criteria for urgent hospital admission. Reasons for hospitalization were urologic emergencies which required urgent care and were categorized as the following: fever, hematuria, hydronephrosis, azotemia, urological malignancy, urinary tract calculosis, urinary tract infections, scrotal phlegmon, testicular torsion, priapism, urogenital trauma and urinary retention. Noteworthy, one patient could have more than one admitting diagnosis. Among patients with urinary tract infection, those who met the criteria for urosepsis [15, 16] represented the subgroup of special interest.

Time from symptoms onset to hospitalization was defined as number of days between date of first appearance of symptoms related to disease which led to hospitalization and date of admission in hospital. Treatment interventions performed during hospitalization were categorized as: surgery (open or minimally invasive / endoscopic), hemodialysis, blood transfusion, transfer to intensive care unit, mechanical ventilation. Treatment outcome was defined as the time from hospital admission to discharge, or death for any reason. During 2020, patients who were hospitalized and suspected of COVID-19 infection later on, were tested by PCR and / or serological tests for the presence of COVID-19 infection. Patients with confirmed COVID-19 infection would be immediately transferred to COVID-19 institution, and were not included in this study.

Statistics

We used the methods of descriptive and analytical statistics for statistical analysis. The significance of the difference for variables with normal distribution among groups of patients was analyzed by Student's t-test for two independent samples, while the Mann–Whitney U-test was used for variables without normal distribution. Differences in frequency between subgroups of patients were analyzed by χ^2 test or Fisher's exact test. The value of p < 0.05 was

considered statistically significant. We used SPSS version 20 for Windows for statistical analysis.

The study has been approved by the Ethics Committee of the Clinical Center of Serbia (decision number 602/5; date: December 31, 2021).

RESULTS

This observational study included 80 patients who were hospitalized during the lockdown from March 15 to June 15, 2020, and 68 patients who were hospitalized in the same period in 2019. All patients met criteria for urgent hospital admission in Emergency Department of Clinic of Urology, UCCS, Belgrade.

Demographic and clinical characteristics at time of hospital admission are shown in Table 1. Most of patients in both groups were men. No significant difference in terms of age and gender was found between two observed periods. Moreover, there was no difference in total number of hospitalized patients when comparing these two periods. Among patients who were hospitalized with a diagnosis of urinary tract infection in 2020, the number of patients with urosepsis was significantly higher (n = 10) compared to the same period in 2019 (n = 3) (p = 0.028) (Table 1). However, no significant differences were observed in terms of other admitting diagnoses between two periods. The median time from symptoms onset to hospitalization was significantly longer in patients who were hospitalized in 2020 (4.5 days) compared to the same period in 2019 (three days) (p = 0.049). (Table 1).

Characteristics of treatment and treatment outcomes are shown in Table 2. The median duration of hospitalization was 7 days in 2020, and did not differ significantly compared to 2019. Morover, there was no significant difference in terms of number and type of treatment interventions performed during hospitalization in two observed periods. In assessing treatment outcome, the number of deaths was significantly higher in 2020 (n = 10) compared to 2019 (n = 2) (p = 0.034) (Table 2).

None of the hospitalized patients in the Department of Emergency Urology had a confirmed COVID-19 infection in the observed period in 2020.

DISCUSSION

The COVID-19 pandemic has disrupted functioning in all spheres of society, including healthcare systems worldwide. Hence, healthcare systems have suddenly faced the demand of caring for an increasing number of COVID-19 patients, with numerous unknowns in the epidemiology, clinical presentation and treatment of the disease itself. Consequently, all of it resulted in the redirection of resources to the management of COVID-19 patients, thus limiting the proper diagnostic workup and treatment of other diseases.

In this study, we aimed to examine the impact of COVID-19 pandemic on routine work of Emergency Department in Clinic of Urology, UCCS, Belgrade and treatment outcomes of hospitalized patients during the first three months of lockdown in Serbia compared to the same period in 2019.

In this study, we have found that number of emergency hospitalizations increased by 17% in the pandemic period, but difference was not significant compared with prepandemic period. Movement restrictions during lockdown, limited availability of health services and the fear of infection with COVID-19 during visits to health facilities had impact on frequency of patients visits to emergency services [4, 17]. By reviewing available literature, a decline in number of patient visits to emergency urological services was reported in many countries during the beginning of the pandemic. However, conflicting results were obtained considering emergency urological hospitalization and surgical treatment [18, 19, 20].

In our study, patients emergency hospitalized did not differ in gender and age when compering prepandemic and pandemic periods. Partly in line with ours, are the results obtained in Portugal where no difference in age was observed, but less women visited the emergency urology service during pandemic period compared to the previous year [19]. Similar findings were obtained in Turkiye, with no difference in age between hospitalized patients in emergency general surgery department and in burn department during the first months of the pandemic [21, 22].

When compared with prepandemic, during the pandemic period our results showed a significantly longer time from symptoms onset to hospital admission. Similar results were reported in Brazilian study that included patients with obstructive pyelonephritis in the pandemic period [23]. Our findings may be partly explained by the restricted free movement and reduced transportation during lockdown, but also by patients' fear of getting infection in a health facility [4]. Morover, establishing of COVID clinics in primary health centers for initial

examination of febrile patients and the convertion of secondary and tertiary healthcare centers into COVID-19 hospitals potentially had impact on time from symptoms onset to hospital admission [21].

In this study we have found that established diagnoses for urgent admission did not significantly differ between two periods. However, among patients with urinary tract infection we noticed significantly higher number of patients who met the criteria for urosepsis in pandemic period. A study conducted in Brazil [23] showed a significantly higher percentage of patients with systemic inflammatory response syndrome among patients with obstructive pyelonephritis in the pandemic period, which is comparable with our results. A recent study by Kaczmarek et al. also showed increased values of inflammatory parameters in patients with stones treated in the urology emergency department during the pandemic period, which the authors potentially interpret as the later coming of these patients to the emergency department [24]. Given the fact that prolonged time from symptom onset to receiving definitive tretament may lead to more complicated course od urinary tract infection, it can explain the higher number of patients with urosepsis found in our study.

Our findings show that duration of hospitalization was similar when comparing Covid and pre-Covid period. Currently, data from studies related to the emergency urological service in the COVID-19 pandemic is limited. Studies published so far are mainly focused on data from emergency urological outpatient clinics [18, 19] or on specific urological pathology [23]. In contrast to our results, Silva et al. [23] showed a significantly longer duration of hospitalization of patients treated for obstructive pyelonephritis in the pandemic period.

Morover, inconsistent findings were reported in studies related to the emergency departments of other surgical branches even in the same country. Namely, one study group from Turkiye showed no difference in the duration of hospitalization among patients who were hospitalized for the treatment of burns in the prepandemic and pandemic periods [22]. In contrast, another study group from the same country found longer hospital stays in emergency general surgery departments during pandemic period [21].

In our study, we have not found significant difference in requirement for surgical treatment of hospitalized patients between the two observed periods, both in terms of number and types of surgery. Consistent with our results are the findings of Cicerello et al. who also did not notice a difference in the need for both open and endourological surgeries in the prepandemic and pandemic periods [18]. In contrast, Madanelo et al. reported an increase in number of patients who required surgical urological treatment at the beginning of the pandemic,

even though the number of visits to the emergency urological service were reduced [19]. A study conducted in The United Kingdom indicate constant surgical treatment of urgent urological conditions during the autumn peak of the pandemic, in contrast to the reduction recorded during the first spring lockdown in 2020 [25].

When analysing treatment outcomes, we found a significantly higher incidence of deaths among hospitalized patients during the first three months of lockdown. Noteworthy is that none of the hospitalized patients at the Department of Emergency Urology of the UCCS had a confirmed COVID-19 infection. To the best of our knowledge, the impact of the pandemic and lockdown on mortality among emergency urology patients has not been assessed so far. However, in one study from an tertiary hospital, Italian investigators reported a negative effect of the COVID-19 pandemic and lockdown on the treatment outcomes of urgent surgical conditions [26]. Based on the findings that delayed access to the emergency department was associated with increased 30-day mortality risk from that study, we could hypothesize a potential association between our results. It is likely that longer time from symptoms onset to hospital admission additionally with higher population with urosepsis among hospitalized patients, have the greatest impact on increased number of deaths in the pandemic period in our cohort.

Limitations of study

The limiting factors of our study are that it is a single- center observational retrospective study with small number of patients. Also, the reasons for delayed patient visit were not examined. However, these limitations reflect everyday clinical practice, which is also the quality of this study.

CONCLUSION

During lockdown in Serbia, patients applied to the emergency urology service significantly later. Furthermore, a higher number of patients with urosepsis and a higher number of deaths among hospitalized patients were found during lockdown compared to the previous year. In the future, prospective studies to evaluate a more complex factors which may influence daily urological practice in emergency departments are needed. These well designed studies will certainly help to detect the field for improvements in taking care of emergency urological conditions.

Conflict of interest: None declared.

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Characteristics	2019	2020	р
Number	68	80	0.324 ^a
Sex, n (%)			
Male	51 (75%)	50 (62.5%)	0 10/a
Female	17 (25%)	30 (37.5%)	0.104
Age (years), mean \pm SD	57.93 ± 19.056	60.88 ± 17.469	0.328 ^b
Time from symptoms onset, days (range)	3 (0–30)	4.5 (0-30)	0.049 ^c
Admitting diagnoses, n (%)			
Fever	23 (33.8%)	26 (32.5%)	0.865 ^a
Hematuria	11 (16.2%)	23 (28.7%)	0.07 ^a
Hydronephrosis	28 (41.2%)	40 (50%)	0.283 ^a
Azotemia	29 (42.6%)	33 (41.8%)	0.864 ^a
Urological malignancy	28 (41.2%)	37 (46.2%)	0.535 ^a
Calculosis	16 (23.5%)	19 (23.8%)	0.975 ^a
Urinary tract infection	30 (44.1%)	30 (37.5%)	0.083 ^a
Urosepsis	3 (10%)	10 (33.3%)	0.028 ^a
Scrotal phlegmon	0 (0%)	1 (1.2%)	1.00 ^d
Testicular torsion	2 (2.9%)	1 (1.2%)	0.467 ^d
Priapism	3 (4.4%)	1 (1.2%)	0.237 ^d
Trauma	3 (4.4%)	3 (3.8%)	0.839 ^d
Urinary retention	1 (1.5%)	5 (6.2%)	0.219 ^d

Table 1. Demographic and clinical characteristics of patients

SD – standard deviation;

^aPearson's χ^2 test;

^bStudent's t-test;

^cMann–Whitney U-test;

^dFisher's exact test

Table 2. Characteristics of treatment and outcomes

Characteristics	2019	2020	р
Duration of hospitalization (days), median (range)	7 (1–55)	7 (1–55)	0.622 ^a
Surgery, n (%)	38 (55.9%)	41 (51.2%)	0.573 ^b
Open	16 (42.1%)	16 (39%)	
Minimally invasive / endoscopic	21 (55.3%)	24 (58.5%)	
Both	1 (2.6%)	1 (2.4%)	0.909 ^b
Hemodialysis, n (%)	3 (4.4%)	8 (10%)	0.196 ^b
Blood transfusion, n (%)	20 (29.4%)	31 (39.2%)	0.212 ^b
Transfer to intensive care unit, n (%)	6 (8.8%)	7 (8.8%)	0.987 ^b
Mechanical ventilation, n (%)	0 (0%)	2 (2.5%)	0.5°
Death, n (%)	2 (2.9%)	10 (12.5%)	0.034 ^b

^a Mann–Whitney U test;

^bPearson's χ^2 test;

^cFisher's exact test