

EPIDEMIOLOGY

Variations in the Number of Patients Presenting With Andrological Problems During the Coronavirus Disease 2019 Pandemic and the Possible Reasons for These Variations: A Multicenter Study



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ABSTRACT

Introduction: Coronavirus disease 2019 (COVID-19) pandemic caused unprecedented restrictions in outpatient services and surgical practices in urology as in other medical branches as well as in all areas of life.

Aim: To investigate whether there have been variations in the presentations of male patients with sexual and reproductive health problems to the outpatient urology clinics during the COVID-19 pandemic and to understand the underlying factors for these variations, if any.

Methods: Male patients aged ≥ 18 years who presented to the outpatient urology clinics in 12 centers across Turkey from February 1, 2020 to June 1, 2020 were retrospectively evaluated. The patients were divided into 2 groups: those who presented to the outpatient clinic from February 1, 2020 to March 11, 2020 comprised the “pre-COVID-19 pandemic period” group, whereas those who presented to the outpatient clinic from March 12, 2020 to June 1, 2020 comprised the “COVID-19 pandemic period” group and compared with each other.

Main Outcome Measures: The main outcome of this study was the number and diagnose of patients presented to urology outpatient clinics.

Results: Andrological problems were detected in 721 of 4,955 male patients included in the study. During the COVID-19 pandemic period, there was a significant increase in andrological diagnosis in these patients compared with the pre-COVID-19 pandemic period ($n = 293$ [17%] vs $n = 428$ [13.2%], $P < .001$, respectively). Similarly, there was a statistically significant increase in the number of patients diagnosed with male reproductive or sexual health problems during the COVID-19 pandemic period ($n = 107$ [6.2%] vs $n = 149$ [4.6%], $P = .016$ and $n = 186$ [10.8%] vs $n = 279$ [8.6%], $P = .013$, respectively). The number of patients diagnosed with erectile dysfunction during the pandemic was also significantly higher than the pre-COVID-19 pandemic period ($n = 150$ [8.7%] vs $n = 214$ [6.6%], $P = .008$).

Conclusion: Presentations to the outpatient urology clinics owing to andrological problems markedly increased during the pandemic period. Although these problems are of multifactorial origin, psychogenic factors are also considered to significantly trigger these problems. **Duran MB, Yildirim O, Kizilkan Y, et al. Variations in the**

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Key Words: Andrology; COVID-19; Erectile Dysfunction; Male Sexual Health; Male Reproductive Health; Pandemic

INTRODUCTION

Coronavirus disease 2019 (COVID-19), a severe acute respiratory syndrome caused by coronavirus 2, first originated in the central city of Wuhan, China, in December, 2019. The disease presents with various clinical manifestations including death.¹ The World Health Organization declared COVID-19 a global health emergency on January 30, 2020 and a pandemic on March 11, 2020.^{2,3} Although common symptoms include dry cough, fever, and shortness of breath, severe clinical cases may present with pneumonia, thereby requiring ventilatory support.⁴ After the first case was detected in Turkey on March 11, 2020, the government gradually increased measures and introduced a partial curfew for citizens aged >65 years and <20 years as well as for those with chronic diseases. Outpatient clinic services, albeit limited, continued, and a gradual normalization process was started in the country on June 1, 2020. The pandemic has caused limitations in various essential services, including health care, requiring reorganization of urology services, as in all other departments. The national and international guidelines issued during the pandemic proposed a reorganization of outpatient services and postponing of elective operations for at least 3 months to prevent hospital beds and healthcare workers from being occupied.⁵ The COVID-19 pandemic has caused significant changes in outpatient services. To decrease the risk of virus exposure to either patients or healthcare workers, elective and preventive visits, such as annual follow-up visits, were deferred. Whenever possible, face-to-face visits were replaced with voice or video calls. In addition, many patients avoided outpatient clinic visits because they did not want to leave their homes and risk getting exposed to the virus.

We hypothesized that the COVID-19 pandemic and restrictions may lead to changes in outpatient urology clinic admissions for andrological reasons. In addition, considering the negative effects of the COVID-19 pandemic on psychological and sexual function, it was hypothesized that reproductive and sexual health diseases could increase. Studies showing that the COVID-19 pandemic has negative effects on sexual function in women have been reported.^{6,7} In this context, this study aims to investigate whether there are any variations in the complaints of patients regarding male sexual or reproductive health during the pandemic period compared with those during the prepandemic period and to understand the underlying factors for these variations, if any.

MATERIALS AND METHODS

Study Design and Participants

In the present study, male patients aged ≥ 18 years presenting to the outpatient urology clinics in 12 centers across Turkey from February 1, 2020 to June 1, 2020 were queried via different hospital information systems, and their electronic patient files and medical histories were examined to retrospectively evaluate the diagnoses made by the doctors. Ten of the centers participating in the study are tertiary care hospitals and 2 are secondary level hospitals and all of them were national pandemic hospital. The study protocol was approved by the local ethics committee (IRB number: 2020/379) and the Ministry of Health of the Republic of Turkey (2020/05/17T19-04-13). The patients' age, sex, date of visit to the outpatient clinic, diagnosis/preliminary diagnosis made at the outpatient clinic, and the number of visits to the outpatient clinics were recorded. Patients were divided into 2 groups and compared with each other; those who presented to the outpatient clinic from February 1, 2020 to March 11, 2020, the date when the first case was detected in Turkey, comprised the "pre-COVID-19 pandemic period" group (pre-COVID), whereas those who presented to the outpatient clinic from March 12, 2020 to June 1, 2020 comprised the "COVID-19 pandemic period" group (COVID period). Outpatient clinic visits contained only face-to-face visits, there were no telephone consultation or video visit. Patients aged <18 years and those without adequate medical history and data were excluded from the study. Moreover, in case of multiple visits to the outpatient clinic, the diagnoses were included in the study only when a new diagnosis was made.

In the present study, andrological diseases were evaluated under the subcategories of male sexual health diseases and male reproductive health diseases. Male sexual health diseases include erectile dysfunction (ED), premature ejaculation, Peyronie's disease, and priapism, whereas male reproductive health diseases include varicocele, infertility, primary/secondary hypogonadism, aejaculation, spermatocoele, and undescended testicles.

Statistical Analysis

Statistical analysis was performed using the SPSS for Windows, version 22, software (SPSS, Inc, Chicago, IL, USA). Descriptive statistics for continuous variables are expressed as mean \pm SD, and nominal variables are expressed as the number and percentage (%). Differences in mean values for each group

Table 1. Demographic and clinical characteristics of patients

| Study parameters | | Pre-COVID period (n = 4478) | COVID period (n = 2142) | p |
|-----------------------------------|--------|-----------------------------|-------------------------|--------|
| Age, y, mean \pm SD | Female | 51.6 \pm 17.1 | 49.3 \pm 16.7 | 0.020 |
| | Male | 55.3 \pm 16.9 | 50.6 \pm 17.1 | <0.001 |
| Male, n (%) | | 3,231 (%72.2) | 1724 (%80.5) | <0.001 |
| Orchitis | | 32 (%1) | 27 (%1.6) | 0.075 |
| Epididymitis | | 21 (%0.6) | 14 (%0.8) | 0.516 |
| Scrotal pain | | 20 (%0.6) | 18 (%1) | 0.102 |
| Hydrocele | | 29 (%0.9) | 16 (%0.9) | 0.914 |
| Urethral stricture | | 60 (%1.9) | 22 (%1.3) | 0.127 |
| Acute prostatitis | | 18 (%0.6) | 14 (%0.8) | 0.286 |
| Chronic prostatitis | | 26 (%0.8) | 21 (%1.2) | 0.153 |
| Prostate cancer | | 186 (%5.8) | 90 (%5.2) | 0.433 |
| Sexual transmitted diseases, Male | | 99 (%3.1) | 81 (%4.7) | 0.003 |
| Urethritis, Male | | 53 (%1.6) | 56 (%3.2) | <0.001 |
| Benign prostate hyperplasia | | 1,164 (%36) | 441 (%25.6) | <0.001 |
| Acute cystitis | Female | 333 (%26.7) | 125 (%29.9) | 0.205 |
| | Male | 209 (%6.5) | 130 (%7.5) | 0.155 |
| Chronic cystitis | Female | 45 (%3.6) | 12 (%2.9) | 0.473 |
| | Male | 4 (%0.1) | 2 (%0.1) | 1.000 |
| Hematuria | Female | 39 (%3.1) | 11 (%2.6) | 0.607 |
| | Male | 53 (%1.6) | 16 (%0.9) | 0.042 |
| Stress urinary incontinence | Female | 45 (%3.6) | 11 (%2.6) | 0.338 |
| | Male | 6 (%0.2) | 1 (%0.1) | 0.433 |
| Urge urinary incontinence | Female | 144 (%11.5) | 29 (%6.9) | 0.008 |
| | Male | 125 (%3.9) | 38 (%2.2) | 0.002 |
| Mixed urinary incontinence | Female | 66 (%5.3) | 16 (%3.8) | 0.231 |
| | Male | 13 (%0.4) | 10 (%0.6) | 0.381 |
| Neurogenic bladder | Female | 54 (%4.3) | 17 (%4.1) | 0.818 |
| | Male | 76 (%2.4) | 37 (%2.1) | 0.644 |
| Bladder cancer | Female | 30 (%2.4) | 11 (%2.6) | 0.797 |
| | Male | 139 (%4.3) | 105 (%6.1) | 0.006 |
| Ureteral stone | Female | 77 (%6.2) | 52 (%12.4) | <0.001 |
| | Male | 175 (%5.4) | 137 (%7.9) | <0.001 |
| Acute pyelonephritis | Female | 6 (%0.5) | 7 (%1.7) | 0.024 |
| | Male | 7 (%0.2) | 1 (%0.1) | 0.276 |
| Simple renal cyst | Female | 51 (%4.1) | 10 (%2.4) | 0.110 |
| | Male | 66 (%2) | 13 (%0.8) | 0.001 |
| Kidney stone | Female | 155 (%12.4) | 54 (%12.9) | 0.794 |
| | Male | 279 (%8.6) | 129 (%7.5) | 0.160 |
| Urooncological diseases* | | 452 (%10.1) | 263 (%12.3) | 0.007 |

COVID = coronavirus disease 2019 pandemic period group; pre-COVID = pre-coronavirus disease 2019 pandemic period group.

*Urooncological Diseases: penile carcinoma, urethral cancer, prostate cancer, bladder cancer, ureteral cancer, kidney cancer and testicular cancer

were evaluated using the Student's *t*-test. Categorical data were compared using the Chi-square distribution. *P* values ≤ 0.05 were considered statistically significant.

RESULTS

From February 1, 2020 to June 1, 2020, a total of 7,063 patients, both men and women, presented to the outpatient urology clinics in 12 different centers. Of these, 443 were aged <18 years and were excluded from the study. Finally, the data of 6,620 adult patients including 1,665 women and 4,955 men were retrieved.

The number of patients who presented during the pre-COVID and COVID periods was 4,478 (67.6%) and 2,142 (32.4%), respectively. Men represented 72.2% (n = 3,231) of the patients presenting during the pre-COVID period and 80.5% (n = 1724) of the patients presenting during the COVID period, and the difference was statistically significant (*P* < .001). Considering the mean age of the patients presenting to the outpatient clinics, there was a statistically significant decline in the mean age of men presenting to the outpatient clinics during the COVID period compared with pre-COVID period (50.6 \pm 17.1 vs 55.3 \pm 16.9 years, respectively, *P* < .001). Table 1 shows the

Table 2. Distribution of andrological diagnoses in male patients managed during COVID period and pre-COVID period

| Study Parameters | Pre-COVID period (n = 3,231) | COVID period (n = 1724) | P |
|--|------------------------------|-------------------------|------------------|
| Andrological diseases, n (%) | 428 (13.2%) | 293 (17%) | <0.001 |
| Male reproductive health diseases, n (%) | 149 (4.6%) | 107 (6.2%) | 0.016 |
| Male sexual health diseases, n (%) | 279 (8.6%) | 186 (10.8%) | 0.013 |
| Erectile dysfunction, n (%) | 214 (6.6%) | 150 (8.7%) | 0.008 |
| Erectile dysfunction, Age, mean \pm SD | 49.4 \pm 12.9 | 45.3 \pm 12.6 | 0.003 |
| Varicocele, n (%) | 86 (2.7%) | 69 (4%) | 0.010 |
| Infertility, n (%) | 45 (1.4%) | 33 (1.9%) | 0.160 |
| Premature ejaculation, n (%) | 46 (1.4%) | 25 (1.5%) | 0.941 |
| Peyronie's disease, n (%) | 36 (1.1%) | 16 (0.9%) | 0.540 |

COVID = coronavirus disease 2019 pandemic period group; pre-COVID = pre-coronavirus disease 2019 pandemic period group. Bold values indicate statistical significant.

Bold values indicate statistical significant.

demographic and clinical characteristics of the patients presenting to outpatient clinics before and during the pandemic.

Overall, 721 of 4,955 male patients had andrological problems. Andrological diagnoses were significantly more common in these patients in the COVID period than in the pre-COVID period (n = 293 [17%] vs n = 428 [13.2%], $P < .001$, respectively). Similarly, there was a statistically significant increase in the number of patients who were diagnosed with male reproductive health or male sexual health problems during the COVID period (n = 107 [6.2%] vs n = 149 [4.6%], $P = .016$ and n = 186 [10.8%] vs n = 279 [8.6%], $P = .013$). Regarding andrological diagnoses, the number of patients diagnosed with ED during the pandemic was significantly higher than the pre-COVID period (n = 150 [8.7%] vs n = 214 [6.6%], $P = .008$). In addition, there was a statistically significant increase in patients diagnosed with varicocele during the COVID period than the pre-COVID period (n = 69 [4%] vs n = 86 [2.7%], $P = .010$). Table 2 and Figure 1 show the distribution of andrological diagnoses in male patients managed during the COVID period and pre-COVID period.

DISCUSSION

The COVID-19 pandemic caused unprecedented restrictions in outpatient services and surgical practices in urology as in other medical branches as well as in all areas of life. To the best of our knowledge, this is the first study to investigate the repercussion of the COVID-19 pandemic on the presentation to the outpatient urology clinics. The main finding of this study is the significant increase of andrological diseases, namely male reproductive and sexual health problems and ED during the COVID period.

Although the COVID period included in this study was longer than the pre-COVID period by 41 days, there was a notable decline of 52.16% in presentations to the outpatient urology clinics in 12 different centers. In line with this finding, a study conducted during the COVID-19 pandemic period showed a 47% decline in presentation to the outpatient neurosurgical clinics and another study found a decline of approximately 56% in presentation to the outpatient orthopedic clinics during the

COVID-19 pandemic period.^{8,9} In a survey with 60 urologists, approximately 96% of the respondents reported a decline in presentation to the outpatient clinics during the COVID-19 pandemic period at varying degrees.¹⁰ In the present study, it was also noted that the ages of the patients presenting to the outpatient clinics during the pandemic were considerably younger. The decline in the both results may be attributed to the “Stay Home” policy implemented in Turkey, increased anxiety in the healthy population as well as among those with chronic diseases, travel restrictions, and curfew for citizens aged >65 years.^{11,12}

The employed male population outnumbers the employed female population in Turkey. An increased number of presentation by male patients may be explained with the flexible and/or home-office working system introduced during the pandemic, allowing the male population to allocate more time for themselves. Another explanation is the significantly higher anxiety rates among women, both healthy and those with chronic diseases, than among men. Therefore, women may have preferred to stay away from the hospital environment where there may be a risk of infection, leading to fewer presentations to outpatient clinics.¹¹

A study based on the International Statistical Classification of Diseases and Related Health Problems diagnosis codes found that andrological problems accounted for 4.4% of the entire population in all age groups; however, there is no consensus on which diagnoses should be considered within the scope of andrology.¹³ The present study did not consider the same diseases under andrology, and as a result of the assessment of the medical histories in each patient's electronic file by urologists, it was found that andrological diseases accounted for 9.5% of all adult patients and 13.2% of adult male patients during the pre-COVID period, whereas they accounted for 13.6% of all adult patients and 17% of adult male patients during the COVID period. In a survey conducted with approximately 1,000 urologists, urology nurses, and interns from across the world, 84% of the respondents reported a decline in presentation to the outpatient clinic with infertility and sexual health problems during the pandemic.¹⁴ The present study, unlike this survey, detected more cases of male reproductive and sexual health diseases during the COVID period than the pre-COVID period.

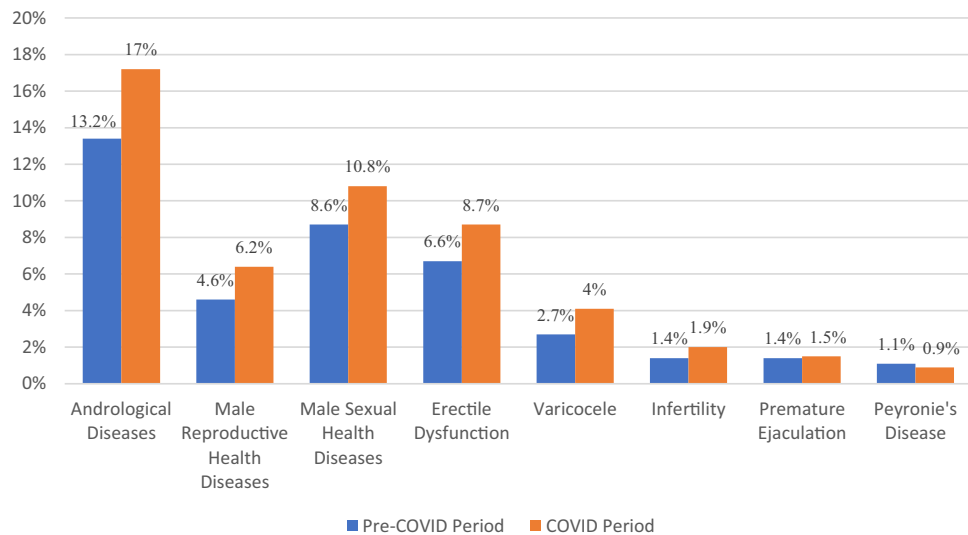


Figure 1. Categorization of urologic diagnoses in male patients managed during COVID period and pre-COVID period. COVID = coronavirus disease 2019 pandemic period group; pre-COVID = pre-coronavirus disease 2019 pandemic period group.

ED is a multifactorial disorder with both organic and psychogenic etiologies.¹⁵ A study that retrospectively evaluated the International Statistical Classification of Diseases and Related Health Problems codes of 9,780 men aged >18 years in the outpatient clinics in Turkey found the prevalence of self-reported ED to be 4.8%.¹⁶ In the present study, the ED rate was 6.6% in adult men during the pre-COVID period and 8.7% during the COVID period, and there was a significant increase in ED diagnosis during the pandemic. The possible reasons for more frequent presentation to the outpatient urology clinics with ED may include the “Stay Home” policy requiring individuals to live side by side for 24 hours a day, limited personal space, and the obligation to share each moment of the day that may have intensified fights and worsened conflicts between couples as well as weakened the bond in relationships, possibly allowing individuals with previous erection problems to face these problem and become more aware of them, in turn resulting in increased embarrassment toward their spouse and prompting them to present to the outpatient urology clinics. The same possible reasons can also apply to patients presenting to the outpatient clinics with reproductive health problems. A possible reason for the increased number of patients presenting to the outpatient clinics both for ED and infertility is the individuals’ tendency to believe that outpatient clinics would be less busy during that period, and thus, more time would be allocated to them and they would be able to express themselves more easily.

It is a well-known fact that the pandemic has caused job losses and economic problems worldwide.¹⁷ Studies have reported that ED is directly proportional to low income and unemployment.¹⁸ From another perspective, it has been reported that anxiety and depression levels of individuals increased during the COVID-19 pandemic period.^{11,12} It is known that depression and anxiety lead to decreased libido and sexual dysfunction.¹⁹ In addition, considering the studies showing the negative effects of the lockdown on the psychological state such as depressive mood, irritability, and fear, the

increased prevalence of ED is likely to be of psychogenic origin.²⁰ Similarly, patients with ED were significantly younger during the pandemic period, supporting the argument for psychogenic ED, with a possible contribution of the curfew for those aged >65 years in Turkey. Similar reasons can be considered for the increased prevalence of andrological diseases as well as increased prevalence of male sexual and reproductive health diseases during the pandemic.

Considering the studies that show a significant decline in presentation to the hospital even with acute coronary syndrome during the pandemic, it is notable how important ED and andrological diseases are for the society.²¹ Furthermore, the European Urology Association guidelines suggest that ED should be evaluated with high priority and examined in detail during the pandemic.²² As also observed in the present study, the frequent presentation of patients diagnosed with oncological diseases and ureteral stone to outpatient clinics during the pandemic shows that patients that were not elective or could not be deferred continued to present to the outpatient clinics.

The present study has some limitations such as its retrospective design. Another limitation is the unequal numbers of patients in the pre-COVID and COVID periods and it does not seem possible to equalize them owing to various restrictions imposed during the pandemic. Other limitations include the lack of data on the socioeconomic levels of patients as well as unequal conditions for presentation to outpatient clinics owing to the curfew applied for individuals aged >65 and < 20 years. And, also because of the retrospective design of the study, the psychological status of the patients were not evaluated with validated questionnaires.

CONCLUSION

To the best of our knowledge, this is the first study to investigate the effect of the COVID-19 pandemic on the

outpatient urology clinics and the results offer a clue about how outpatient urology clinics can be affected during a pandemic. In this study, it is noteworthy that there was an increase in the number of patients who presented to the outpatient clinics with male reproductive and sexual health diseases, particularly with ED, during the pandemic. It should be considered that psychogenic factors may have affected the presentation to the outpatient clinics. It is believed that the psychogenic dimension of ED, a multifactorial disorder, stood out during this period. After the pandemic period, necessary time should be given and optimal conditions should be provided for patients to feel more comfortable, particularly in the case of male reproductive and sexual health diseases.

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