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Original Article

Erectile Dysfunction in Hospitalized Men with COVID-19

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HIGHLIGHTS

• The patients with COVID-19 had erectile dysfunction and sextual dissatisfaction.
• Screening for mental problems is recommended for people with COVID-19.

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ABSTRACT

Introduction
Erectile dysfunction (ED) is suspected to be the symptom manifestation of COVID-19. However, scarce data was presented on this day. Our study was conducted to determine the prevalence of ED and its associated factors among hospitalized men with COVID-19.

Methods
In this report, 35 male patients infected with COVID-19 were hospitalized in Imam Ali Andimeshk Hospital and screened for erectile dysfunction by the International Index of Erectile Function 5 (IIEF-5). Demographic data and COVID-19 treatment history were collected.

Results
35 male patients with COVID-19 were examined. ED prevalence was 64.7%, of which severity was mostly mild. Logistic regression, adjusted for age, BMI, and medical comorbidities, portrayed a significant association between ED and mental health status.17 men were dissatisfied with sexual contact and not reaching orgasm due to the fear of their partner getting infected, nine patients had diabetes, and one patient had a history of hives. Five people reported that they had been suffering from urinary system stones in the past.

Conclusions
In patients with COVID-19, the prevalence of ED was not high, but they had erectile dysfunction and sexual dissatisfaction; therefore, screening for mental problems in people with COVID-19 and ED is recommended.
Keywords: COVID-19; Erectile Dysfunction; IIEF-5

Introduction

The global COVID-19 pandemic, caused by the SARS-CoV-2 virus, has affected entire populations worldwide. Apart from the respiratory system, its primary manifestation, extra-pulmonary manifestations of COVID-19 infection could also be found, including symptoms in the reproductive system. The negative impact on male reproductive health should be of concern because the virus can directly injure testicular tissues by binding with angiotensin-converting enzyme 2 (ACE2) receptors highly expressed in the reproductive organs (1). The presence of the virus in penile tissues and relatively lower levels of endothelial progenitor cells were reported in two patients with a history of COVID-19 infection. They were subsequently diagnosed with severe erectile dysfunction (ED), which could be explained by endothelial dysfunction (2). In patients with COVID-19, ED is caused by multiple physical and mental etiologies, such as endothelial dysfunction, subclinical hypogonadism, pulmonary hemodynamic impairment, and mental comorbidities (3). Mental health problems are considered to be an obvious consequence of the pandemic. Higher psychiatric disorders were reported globally during the outbreak, including major depression and anxiety disorders (4). These several contributing factors complicate the etiologies of ED in the pandemic among men in good health and male patients with either recovered or current COVID-19 infection.

Although patients with current COVID-19 infection should have the highest risks of developing ED, studies in this population are limited (5). Furthermore, population-

specific studies are necessary for sexual dysfunction research because of region-specific cultural differences and conservative beliefs, especially in Asian countries, where sexual dysfunctions are usually undiagnosed and untreated (6). There is still no study evaluating ED and its contributing factors among patients with COVID-19 infection in Iran. It is questionable whether ED in this Asian country would differ from previous studies in non-Asian populations. Our study aimed to measure the prevalence of ED by using the International Index of Erectile Function 5 (IIEF-5) among patients with current COVID-19 infections.

Methods

In this study, 35 male patients with coronavirus who were hospitalized in Imam Ali Andimeshk Hospital were examined. This study was approved by the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS.MEDICINE.REC.1396.2732). The severity of the disease of these people was not enough to require hospitalization in the intensive care unit, and these people had referred to the urology clinic on an outpatient basis after being treated for COVID-19 due to sexual dysfunction. The age of the subjects was between 19 and 57 years old.

Eligibility criteria not having sexual problems before contracting COVID-19, It has been 3 to 8 months since being infected with COVID-19.

Exclusion criteria people's unwillingness to participate in the study, having sexual problems.

Before the assessment, informed consent was obtained verbally or via an online application to prevent viral transmission. Instead of online assessment questionnaires, a phone interview was done with illiterate participants.

Demographic data were obtained, including age, BMI, underlying diseases, and alcohol and nicotine use history. Details about COVID-19 vaccination and treatment during hospitalization were extracted.

A Thai version of the International Index of Erectile Function 5 (IIEF-5)

A Thai version of the International Index of Erectile Function 5 (IIEF-5) erectile function was measured by a Thai version of IIEF5. This tool has five questions focusing on ED and satisfaction with sexual intercourse. Its scores negatively correlated with ED severity and could be classified into five levels; severe (5-7), moderate (8–11), mild to moderate (12–16), mild (17–21), and no ED (22–25) (7).

Statistical analysis

Descriptive statistics were used to report demographic data, mental health status, and COVID-19 treatment. We used Pearson's Chi-square or Fisher's exact test to determine the difference among categorical data and student t-test or Mann-Whitney U test for continuous data. Bivariate and multivariable logistic regression was used to explore factors associated with erectile dysfunction. For the multivariable model, we planned to adjust clinically essential covariates, including theoretically associating the factor of ED with a factor with a P-value below 0.20 in the bivariate model. A P-value<0.05 was considered statistically significant.

Results

Throughout the study period, 35 samples with COVID-19 were screened. Mean age and BMI were 19-57 years and 25.6-26.2 kg/m2, respectively. Most were married or couples (81.7%), employed (93.5%), and had educational attainment lower than a bachelor's degree (84.3%). In all participants, morning erection tended to be expected. Previous use of ED medications was reported in 6 participants. 8 and 21 participants screened positive for generalized anxiety disorder and major depression, respectively. The overall prevalence of ED was 64.7%. Mild ED (45.1%) was the most prevalent, followed by moderate (15.7%) and mild to moderate (3.9%) severity. None of the participants had severe ED (Table 1). It was also reported that 17 men were dissatisfied with sexual contact and not reaching orgasm due to the fear of their partner getting infected, 9 men because of diabetes and 1 man had a history of hives, and 5 men reported that they were suffering from urinary system stones in the past.

Discussion

ED, the most concerning male sexual dysfunction (8), has not been widely studied in some Asian countries. Even in this pandemic, several studies have focused on the impact of COVID-19 on multiple dimensions of health but not on sexual function. The prevalence of ED among patients with COVID-19 was 64.7%. This was significantly higher than findings from previous studies (8-12) in the average population, which estimated the prevalence around 37.5-42.2% (two proportion Z-test P-value<0.05). One study from Italy also reported a higher prevalence of ED in COVID-19 groups compared to the average population after adjusting for age, BMI, and psychological status (5). However, the study's prevalence of ED in COVID-19 patients was significantly higher than in Italy (64.7%

Table 1. Erectile Dysfunction in Men with COVID-19

Erectile Dysfunction	Percent
Mild	45.1
Moderate	15.7
Mild-moderate severe 3.9%	0
Total	64.7

vs. 28%, P-value<0.05). We believed both medical and psychological factors might determine our differing results.

The variants of SARS-CoV-2 are also responsible for the severity and infectivity of COVID-19 (13). Well known for its high transmission rate and increased severity, this strain might be dissimilar to the variant, which was not mentioned in a previous study (14, 15).

Our participants' mean age was older than the study in Italy, with a maximum reaching 57 years, and the mean BMI was also higher (25.6vs.22.5 kg/m2). This may be another factor among several related bio-psychological factors that should be considered to explain the difference in ED prevalence.

Interestingly, age, BMI, and medical comorbidities understood as ED risk factors were not significantly associated with ED. This could be explained by the low number of our sample size. Most participants reported having a regular morning erection, which might indicate an intact erection capacity. Thus, these biological factors might play less part in ED etiologies among our participants. Psychological impacts, including stress, anxiety, and depression, should be emphasized since they were highly correlated with ED during this pandemic, as found in the prior study (16).

This study population is patients with a mild infection with Covid-19 who do not need to be hospitalized. Furthermore, investigations such as hormonal level, nocturnal penile tumescence testing, or Duplex Doppler ultrasound could not be conducted due to the risk of COVID-19 transmission. All questionnaires could also be influenced by recall bias; thus, the responders might reply mainly based on their recent periods (17). However, it was beneficial in terms of the results that could better represent each individual's status during his acute COVID-19 infection. Future prospective studies will help identify the causation of ED or its long-term effects caused by COVID-19. Also, further studies focusing on the management and its accessibility are still needed to alleviate the impact of COVID-19 on men's health (18).

Conclusions
Based on the questionnaire of patients with COVID-19, the prevalence of ED was not high, but the disorder in maintaining an erection and dissatisfaction with sexual contact and reaching orgasm were reported. So, ED should be assessed as multifactorial in origin, considering psychological factors. Healthcare providers are suggested to screen for mental problems in individuals with ED and vice versa, with prudent cultural consideration.

Authors' contributions
All authors contributed equally.

Ethics statement
This study was approved by the Ethics Committee of Tehran University of Medical Sciences (IR.TUMS. MEDICINE.REC.1396.2732).

Data availability
Data will be provided on request.

Abbreviations
ACE2   Angiotensin-converting enzyme 2
ED   Erectile dysfunction
IIEF-5   International index of erectile function 5

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