Research Article

Frequency and Severity of Erectile Dysfunction in Men Hospitalized for COVID-19 in Colombia

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Abstract

Introduction: Endothelial dysfunction caused by the coronavirus COVID-19 and the stress resulting from this disease can affect erectile function in men who have had COVID-19 This could be worse in severe cases requiring intermediate or intensive care hospitalization.

Aim: To estimate the frequency of erectile dysfunction in men hospitalized for COVID-19 at a high-complexity clinic in Colombia.

Methods: We conducted a cross-sectional observational study. Telephone surveys were conducted with men over 18 years of age who were hospitalized for COVID-19. The International Index of Erectile Function – Erectile Function domain (IIEF-EF) and Erection Hard Score (EHS) questionnaires were applied, and sociodemographic and clinical variables were evaluated. The frequency and severity of dysfunction were estimated based on the IIEF-EF questionnaire scores.

Outcome: Proportion of patients with an IIEF-EF score less than 26.

Results: 57 patients participated in the study, with 12 hospitalized in an intensive care unit and 45 in a low complexity unit. The estimated frequency of erectile dysfunction was 31.6%. The highest percentage of cases of dysfunction was seen in the low-complexity hospitalization group. The percentage of complications after COVID-19 was 75% in intensive care and 73% in low complexity, of which 10% reported depression and anxiety.

Clinical Implications: Erectile function can be affected in men with COVID-19 due to organic or psychological causes.

Conclusions: The frequency of erectile dysfunction in subjects of this study, hospitalized for COVID-19, is similar to that reported in populations with different severity levels of this disease.

ABBREVIATIONS

DE: Erectile Dysfunction; RT-PCR: Reverse Transcription Polymerase Chain Reaction; ICU: Intensive Care Units

INTRODUCTION

COVID-19, now widely known, was only identified just over three years ago [1]. The first case in Latin America was reported on February 27th, 2020, in Sao Paulo, Brazil. In Colombia, the first case was reported on March 13th, 2020. As of February 6th, 2023, Colombia has reported 6,357,200 cases with 142,544 deaths and 6,181,431 recovered [2]. The presence of comorbidities such as obesity, diabetes, hypertension, coronary artery disease, heart failure, and chronic lung disease increases the risk of severe COVID-19 cases requiring hospital management [3]. These conditions include significant endothelial dysfunction as part of their pathophysiological mechanisms, and they have also been proposed to explain the presence of erectile dysfunction (ED), which is more common in these patient groups [4].

A relationship between COVID-19 and ED has been suggested, which is not only explained by physical factors but also by psychogenic causes such as depression and anxiety [5]. COVID-19 and ED share common pathophysiological mechanisms, and conditions that increase the likelihood of COVID-19 complications also increase the risk of ED, not only through endothelial involvement but also through vascular, hormonal, pulmonary, and psychological factors [6].

In Latin America, there are few studies that assess the prevalence of ED in men who have had COVID-19. One of these is a large online survey in which 37.5% of participants reported sexual dysfunction, and this survey also included participants from Colombia [7]. To our knowledge, no studies have been conducted in patients with more severe COVID-19 cases, where greater endothelial dysfunction may be expected to result in a higher frequency of erectile dysfunction. Our aim is to estimate the frequency of erectile dysfunction in men diagnosed with COVID-19 who were admitted to an intensive care unit or low-

complexity hospitalization in 2021 in a clinic in Barranquilla, Colombia

MATERIALS AND METHODS

We conducted a cross-sectional observational study. We identified men over 18 years of age in the patient registry for COVID-19 cases treated at a clinic in Barranquilla, Colombia, who were diagnosed with COVID-19 confirmed by Reverse Transcription Polymerase Chain Reaction (RT-PCR) or antigen detection test, and who were admitted as primary cases or reinfections between January 1st and December 31st, 2021, in low-complexity or intensive care units (ICU). A sample size of 310 subjects was determined, aiming for an expected proportion of 28% with a 95% confidence level and a 5% precision around the population parameter. The sampling strategy will involve randomly selecting patients from the COVID-19 database who meet the inclusion criteria. Patients without email or phone number data, those who were hospitalized or in the ICU at the time of the survey, those with incomplete data for variables of interest, those with psychiatric or neurological conditions that would make the survey difficult to apply, or those with conditions that prevented them from accepting and signing the informed consent were excluded.

Patients were contacted via telephone and invited to participate in the study by a research assistant or a researcher. Those who agreed to participate were sent the informed consent document, and a telephone survey was administered, including the IIEF-EF questionnaire, validated in Spanish in Latin America [8], and the EHS, also validated in Spanish [9].

Sociodemographic data, medical history, complications after a COVID-19 infection, and perception of erection after this event were also confirmed during the call.

The IIEF-EF consists of 6 questions, each with 5 response options, for a total score of 30 points. A score of less than 26 indicates erectile dysfunction, and depending on the score, it can be classified as mild (22-25 points), mild to moderate (17-21 points), moderate (11-16 points), and severe (1-10 points) [8]. The EHS assesses the hardness of the erection on a scale of 0 to 49. The perception of erection after recovering from COVID-19 was subjectively evaluated with the question "Do you notice any deterioration in your erection after having COVID?"

This study was approved by the ethics committee for Biomedical Research at the Fundación del Caribe para la Investigación Biomédica and was conducted following the principles for research involving human subjects described in the Declaration of Helsinki and national regulations. All patients signed informed consent forms before participating in the study.

Statistical Analysis

A descriptive analysis of the variables of interest was performed. Absolute and relative frequencies were estimated for categorical variables, and measures of central tendency and dispersion were calculated for quantitative variables. Erectile

dysfunction was defined as a score of less than 26 on the IIEF-EF questionnaire. The total proportion of ED and severity level (mild, mild to moderate, moderate, and severe) was estimated. The proportion of ED was also estimated for patient groups according to the level of complexity. The analyses were conducted using Stata 15.2.

RESULTS AND DISCUSSION

A total of 1,299 patient records for COVID-19 cases treated in 2021 were found, of which 212 met the selection criteria. Of these patients, 131 (61.8%) could not be contacted because they did not answer phone calls or their phone numbers did not correspond to the patients. An additional 24 (11.3%) were not interested in participating in the study.

Finally, 57 subjects were included in the study. The average age of the participants was 51.9 years (SD 16.5), 64.9% (n=37) were married or in a common-law relationship, 10.7% (n=6) were smokers, and 63% (n=36) consumed alcohol occasionally (once or twice a month). Of the 57 patients, 45 (78.9%) were treated in low-complexity hospitalization, while 12 (21.1%) required treatment in the intensive care unit (ICU), and 5 of them (8.8%) required intubation and invasive mechanical ventilation. In total, 35 (61.4%) subjects had comorbidities, with 8 of them hospitalized in the ICU and the remaining 27 hospitalized in low complexity. Table 1 presents complete demographic data and clinical characteristics of the participants according to the place of hospitalization [Table 1].

Table 1: Demographic Data and Patient Condition, by Hospitalization Unit

Characteristics	ICU (n=12)	Low Complexity (n=45)	Total
Average Age (± SD)	53.5 years ± 12.1	51.6 years ± 17.5	51.9 years ± 16.5
Marital Status			
Married	5 (41.7)	14 (31.1)	19 (33.3)
Single	1 (8.3)	15 (33.3)	16 (28.1)
Common-law	5 (41.7)	13 (28.9)	18 (31.6)
Separated	1 (8.3)	2 (4.4)	3 (5.3)
Widowed	0 (0.0)	1 (1.8)	1 (1.8)
Pre-existing Health Conditions Before COVID-19			
Anxiety	0	2 (4.4)	2 (3.5)
Asthma	0	1 (2.2)	1 (1.8)
Prostate Cancer	0	2 (4.4)	2 (3.5)
Depression	0	1 (2.2)	1 (1.8)
Diabetes	3 (25.0)	8 (17.8)	11 (19.0)
Coronary Artery Disease	0	4 (8.9)	4 (7.0)
Chronic Obstructive Pulmonary Disease - COPD	0	1 (2.2)	1 (1.8)
Hyperlipidemia	1 (2.2)	3 (6.7)	3 (5.2)
Benign Prostatic Hyperplasia	0	2 (4.4)	2 (3.5)
Hypothyroidism	1 (8.3)	0	1 (1.8)
Hypertension	7 (58.3)	17 (37.8)	24 (42.0)
Chronic Kidney Disease	1 (8.3)	0	3 (6.7)
Obesity	3 (25)	1 (2.2)	4 (7.0)
Lifestyle Habits			
Tobacco use	0 (0.0)	6 (13.3)	6 (10.7)
Alcohol consumption	9 (75)	27 (60)	36 (63.0)

Regarding erectile dysfunction, 18 subjects (31.6%) reported a score of less than 26 on the IIEF-EF questionnaire, with the majority classified as moderate (7 patients, 12.3%); 5 patients reported not having sexual intercourse. When evaluating the frequency of dysfunction according to the level of complexity of hospitalization, it was observed that of the 8 patients in the ICU, only one had erectile dysfunction, classified as moderate [Table 2].

In the assessment of penile hardness using the EHS questionnaire, it was observed that 12 patients (21%) did not have an erection sufficient for penetration with their partner (score less than 3), 2 of whom were treated in the ICU [Figure 1].

Regarding erectile function after recovering from COVID-19, 19 patients (33.9%) reported a deterioration in the quality of their erection, 17 of whom received treatment in a low complexity setting [Table 3].

In addition to erectile dysfunction, general complications that patients experienced after COVID-19 were reviewed, we found out that 9 patients in the ICU and 33 hospitalized in low complexity had some type of complication. The most common were musculoskeletal disorders, which occurred in 42% of

Table 2: Severity of Erectile Dysfunction by IIEF15-EF Questionnaire Results and Hospitalization Location

Degrees of Erectile Dysfunction According to IIEF-EF	Total Patients	ICU	Low Complexity
No Erectile Dysfunction	34 (59.7)	10 (83.3)	24 (53.3)
Mild	5 (8.8)	0	5 (11.1)
Mild to Moderate	3 (5.3)	0	3 (6.7)
Moderate	7 (12.3)	1 (8.3)	6 (13.3)
Severe	3 (5.3)	0	3 (6.7)
No Sexual Activity	5 (8.8)	1 (8.3)	4 (8.9)
Total Cases of ED	18 (31.6)	1 (8.3)	17 (37.8)

Abbreviations: ED: Erectile Dysfunction; ICU: Intensive Care Units

Table 3. Number of Patients Reporting Worsening of Erection After Recovering

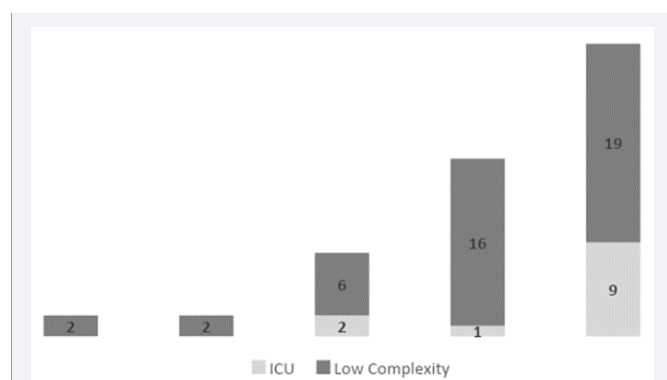| Do You Notice Worsening of Your Erection After Recovering from COVID-19	Treatment Received	Total
Yes, Notice Changes	19 (33.9)	2 (16.7)
No, No Changes	37 (66.1)	10 (83.3)

Figure 1 EHS Questionnaire Results by Hospitalization Location

Table 4. Complications after recovering from COVID by level of complexity

Type of Complication	ICU	Low Complexity	Total
Memory Alterations	0(0,0)	1(2,2)	1 (1.8)
Musculoskeletal Alterations	6(50)	18(40)	24 (42.0)
Anosmia	0(0,0)	3(6,7)	3 (5.2)
Anxiety and Depression	1(8,3)	5(11,1)	6 (10.5)
Cardiac Arrhythmia	0(0,0)	4(8,9)	4 (7.0)
Headache	0(0,0)	1(2,2)	1 (1.8)
Coagulopathy-Thrombotic Event	0(0,0)	1(2,2)	1 (1.8)
Dyspnea	4(33,3)	12(26,7)	16 (28.0)
Chronic Abdominal Pain	0(0,0)	1(2,2)	1 (1.8)
Peripheral Vascular Disease	0(0,0)	1(2,2)	1 (1.8)
Pulmonary Fibrosis	0(0,0)	1(2,2)	1 (1.8)
Hypertension	0(0,0)	1(8,3)	1 (1.8)
Lower Urinary Tract Symptoms	1(8,3)	0(0,0)	1 (1.8)

patients (n=24), followed by dyspnea (28%, n=16) and anxiety/depression (10.5%, n=6) [Table 4].

DISCUSSION

In our study, we calculated a frequency of erectile dysfunction of 31.6%, a result similar to the 30% reported by Hu et al. [5], and the 37.5% reported for Latin American men by Pérez et al., [7]. Contrary to our initial expectations, this frequency is lower than that reported in pre-pandemic population studies, such as the DENSA study conducted in Colombia and other South American countries, which found a prevalence of erectile dysfunction of 52.8% [10]. This could be explained by the sample obtained, as the difficulty in contacting hospitalized patients in this institution may mean that it is not representative of the COVID-affected population or the general population. Additionally, the results of the EHS showed that half of the patients had erection problems that prevented them from penetrating their partner or having a satisfactory sexual relationship.

The difference in the ranges of age of the participants in this study compared to other studies in Latin America, where ages between 18 and 33 years 7 were reported, and studies in Europe where the average age was 32.83 ± 11.24 years [11], is striking. One explanation for this is that the questionnaires in other studies were sent through social networks and many young men have greater access to those platforms. Additionally, an increase in urological consultations was observed in this age group, which included cases of erectile dysfunction [12].

Patients with comorbidities such as diabetes, hypertension, and obesity have a higher risk of severe COVID-19 requiring hospital treatment [3], and the presence of these comorbidities can explain much of the presence of erectile dysfunction [4]. It would be expected that patients in the ICU had a higher frequency of comorbidities. In our study, it is noteworthy that these pathologies were present in similar percentages (66.7% and 60%) for those who received treatment in the ICU and hospitalization, respectively. Based on the same concept, it was expected that patients treated in the ICU would have a higher frequency of ED, but contrary to this idea, most patients in this group did not have this sexual dysfunction, while more than a

third of those treated in a low-complexity hospitalization setting reported this condition. Age does not explain this difference, as although the average age in the ICU group was slightly higher, there is no significant difference with the other group. Patients in the low-complexity hospitalization setting group all had comorbidities associated with ED [4,13-16], such as coronary artery disease, lung diseases, and prostate pathologies, which were not present in the ICU group. Other comorbidities such as renal insufficiency and dyslipidemias were more frequent in the low-complexity hospitalization group.

Regarding complications after recovering from COVID-19, our study found a similar proportion in patients hospitalized in the ICU or low complexity (75% and 73%, respectively), with musculoskeletal disorders being the most common, as previously reported in different studies [5,17]. However, such complications are not associated with erectile function. In contrast, anxiety and depression, observed in 10.5% of patients in the study, have been linked to erectile dysfunction with or without COVID-19, especially in men under 40 years of age [5,12,14].

Patients included in our analysis were only hospitalized or in the ICU. This differs from most published studies where samples were taken from the general population without considering the management they received, so cases of COVID-19 of varying severity were included [7,11,18] Another important aspect is the data collection date and the time between the presentation of COVID-19 and the evaluation of erectile function; for our analysis, data were obtained in 2022, whereas in other studies, the data was collected in the course of 2020 [7,11,18], during the highest infection rates of COVID-19.

Overall, it is known that the pandemic has affected the sexual life of the population, both men and women. In the case of erectile dysfunction, exposure to the COVID-19 pandemic is associated with erection disturbances and an increased prevalence of ED [18]. However, it is still difficult to establish a cause-and-effect relationship because most studies have been conducted as a case-control design.

A strength of our study is that it was only conducted in a population with more severe cases of COVID-19, which helps us understand whether there is indeed a difference between the severity of COVID-19 and the likelihood of having ED. Regarding weaknesses, one of them is that due to the cross-sectional design, it is not possible to establish temporality between the presence of ED and their past medical history, nor with the complications after having had COVID-19. Additionally, the survey was conducted several months after recovering from COVID-19, which may introduce recall bias. This same aspect led to a lower contact percentage than desired, so the sample size is small, and there may be a selection bias due to the inability to contact patients who were hospitalized in the ICU and either died or were not in a condition to answer the survey.

CONCLUSION

The frequency of erectile dysfunction in Colombian patients with more severe cases of COVID-19 is similar to that reported in populations with different severity levels of this disease. It is impossible to assess a cause-and-effect relationship with this type of study. The frequency of erectile dysfunction in subjects of this study, hospitalized for COVID-19, is similar to that reported in populations with different severity levels of this disease.

ACKNOWLEDGEMENTS

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