

# Effect of COVID 19 on Lower Urinary Track Symptoms in Patients With Benign Prostatic Hyperplasia

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## Research Article

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# Abstract

**Background:** Lower Urinary Track Symptoms (LUTS) in patients with BPH could be assessed by the International Prostate Symptom Score (IPSS). Studies find that COVID-19 can be detected in urine samples, although unreliably, this suggest the need to investigate whether the virus has effect on the urinary track especially those who are with pre-morbid conditions such as BPH. Hence the study aims to assess the effect of COVID-19 on the LUTS measured objectively by the IPSS on patients with BPH.

**Methods:** 85 male patients over 40 years of age already diagnosed with BPH were included in the study. Any patient who recovered from a confirmed oropharyngeal swab PCR test was reassessed using I-PSS. Post-COVID19 IPSS surveys were compared to pre-COVID19 ones.

**Results:** Out of 85 subjects, 39 (45.9%) were mild before COVID-19 compared to 19 (22.4%) after the infection. 46 subjects (54.1%) were moderate before COVID-19, whereas, 66 (77.6%) became moderate after the infection, ( $P < 0.001$ ). The mean IPSS score of patients after they receive the appropriate treatment was found to be (8.1), while the mean score after COVID-19 infection was found to be (9.8). ( $P < 0.001$ ) using paired sample t test.

**Conclusions:** COVID-19 is associated with higher I-PSS score in patients with BPH, and more objective assessments are needed for further investigation.

## Introduction:

Benign Prostatic hyperplasia (BPH) is the enlargement of the prostate gland in men which is totally not cancerous. Historically, the condition was called benign prostatic hypertrophy or benign prostatic obstruction<sup>1</sup>. Clinically, BPH presents most commonly with Lower Urinary Track Symptoms that is divided into obstructive symptoms such as hesitancy, dribbling, weak stream, and incomplete bladder emptying and irritative symptoms which include frequency, urgency, urge incontinence, and nocturia<sup>2</sup>. Age is the main and most contributing factor among other causes as 70% of men in the United States 60–69 years of age and 80% of those 70 years of age or older are affected by BPH<sup>3</sup>.

Lower Urinary Track Symptoms (LUTS) in patients with BPH could be assessed by the International Prostate Symptom Score (IPSS). It is self administered eight-questions screening tool designed to rapidly diagnose, track the symptoms of, and suggest plan of management of a patient with BPH. Seven questions out of the eight questions are related to the symptoms experienced in the last month. It includes feeling of incomplete bladder emptying, intermittency of urinary stream, frequency of urination, weak stream, urgency of urination, straining and nocturia<sup>(4)</sup>. The eighth question was added by the World Health Organization to include quality of life<sup>(5)</sup>. The score ranges from zero to thirty five which breakdowns as follows; from zero to seven is considered mildly symptomatic, from eight to nineteen is considered moderately symptomatic, and from twenty to thirty five is considered severely symptomatic.

The coronavirus 2019 disease (COVID-19) affected millions of people and resulted in hundreds of thousands deaths around the world <sup>(6)</sup>. Symptoms of the disease vary largely between affected individuals with majority experiencing mild symptoms -if any- such as fever, upper respiratory tract symptoms, shortness of breath, and diarrhea. In severe cases, pneumonia, adult respiratory disease syndrome, multi organ failure, and death may occur <sup>(7)</sup>. It has been shown in studies that the COVID-19 is more severe and fatal in older men <sup>(8)</sup>.

## **Purpose:**

COVID-19 has affected systems other than the respiratory system such as cardiovascular, renal, neurological, and gastrointestinal systems <sup>(9)</sup>. Also some studies find that it can be detected in urine samples <sup>(10)</sup> although unreliably, this suggest the need to investigate whether the virus has effect on the urinary track especially those who are with pre-morbid conditions such as BPH. Hence the study aims to assess the effect of COVID-19 on the LUTS measured objectively by the IPSS on patients with BPH.

## **Methods:**

Prior to the study, ethical clearance was taken from local ethical committee at King Fahad Hospital, Albaha, Saudi Arabia. 85 male patients over 40 years of age already diagnosed with BPH and have been on regular management for at least 6 months, were included in the study. Any patient who recovered from a confirmed oropharyngeal swap PCR test was reassessed using I-PSS. Post-COVID19 I-PSS surveys were compared to pre-COVID19 ones.

Statistical analysis was conducted through IBM SPSS 20.0 software (SPSS Inc., Chicago, IL, USA). The analysis of the data was divided into two major comparing methods. In the first one, the patients were divided into three groups based on their scores in the I-PSS survey: group 1: mild (0–7), group 2: moderate (8–19), and group 3: severe (20–35). Then the categorical data pre and post-COVID19 were tested using Chi square. In the second comparing method, raw values of the IPSS score (0-35) were used and pre and post-COVID19 scores were compared against each other using paired sample t test. A p value of < 0.05 was considered statistically significant.

## **Results:**

Severe cases were only found in the pretreatment IPSS scores at the initial visits to the clinic or at the time of diagnosis. Out of 85 subjects, 39 (45.9%) were mild before COVID-19 compared to 19 (22.4%) after the infection. 46 subjects (54.1%) were moderate before COVID-19, whereas, 66 (77.6%) became moderate after the infection. Chart No.1.

Mild and moderate cases differ significantly between post-treatment IPSS score compared to post-COVID19 IPSS score using Chi square test ( $P < 0.001$ ) (Table 1).

**Table 1:** Post-COVID19 versus Post-treatment Crosstabulation

		Post-treatment		Total
		Mild	Moderate	
Post-COVID19	Mild	16	3	19
	Moderate	23	43	66
Total		39	46	85

The mean IPSS score of patients after they receive the appropriate treatment was found to be (8.1), while the mean score after COVID-19 infection was found to be (9.8). The difference is significant ( $P < 0.001$ ) using paired sample t test.

## Discussion:

COVID-19 has reached unprecedented levels in the recent history. The number of confirmed cases exceeded 144 million as of 24th April 2021 and the number of deaths surpassed three millions according to Johns Hopkins University. Several vaccines were developed and the vaccination process varies greatly between countries and regions. However, many of these vaccines are facing criticism and suspensions over the possible serious adverse effects. On the bright side, health systems around the world are acclimatizing and getting better in dealing with crises. Patients with BPH faced difficult times during the first wave as most of the clinic appointments were cancelled, however, the situation is far better in the current days.

COVID-19 mortality and morbidity increase significantly in age group of BPH patients<sup>11</sup>. Also male patients are more likely to be affected by the virus<sup>12</sup>. BPH incidence increases dramatically with age from only 8% in the 4th decade to over 70% in the 7th decade<sup>13</sup>. The I-PSS is one of the best tools to assess the LUTS. High I-PSS was found to be related to significantly higher intensive care requirement, time to admission to ICU, and mortality rates in patients diagnosed with COVID-19<sup>14</sup>. Also it has been found that the severity of COVID-19 can be predicted by LUTS in patients with BPH<sup>14</sup>. In the data we obtained, post-COVID-19 infection in patients with BPH is associated with higher I-PSS whether in higher mean I-PSS score or changes from mild to moderate in categorization of the score. However, the data were limited to observational assessment through I-PSS only, and further assessment through more objective tests such as imaging, serum, or urine markers should be sought.

## Limitations

The study is limited to only I-PSS surveys due the limited services in the hospital as it is the main isolation COVID-19 center in the region.

## **Conclusion:**

In conclusion, based on the data we obtained, COVID-19 is associated with higher I-PSS score in patients with BPH, and more objective assessments are needed for further investigation.

## **Abbreviations**

BPH: Benign Prostatic Hyperplasia.

I-PSS: International Prostate Symptom Score.

COVID-19: Corona Virus Disease 2019

LUTS: Lower Urinary Tract Symptoms.

## **Declarations**

### **Conflict of Interest Statement:**

There is no conflict of interest of any of the authors in relation to conduct of the study or the submission.

### **Ethical Clearance:**

All methods were carried out in accordance the King Fahad Hospital ethical committee (IRB), Albaha, Saudi Arabia. Informed consent was obtained from all subjects involved in the study.

### **Consent for Publication:**

Not Applicable

### **Availability of Data and Materials:**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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### **Author's contribution:**

A E is the main author who generated the research question, formulated the hypothesis of the study, gathered the required data, and obtained the ethical clearance.

A A participated in interpreting the data, analysis, reviewing the literature, and formulating the results and discussion parts.

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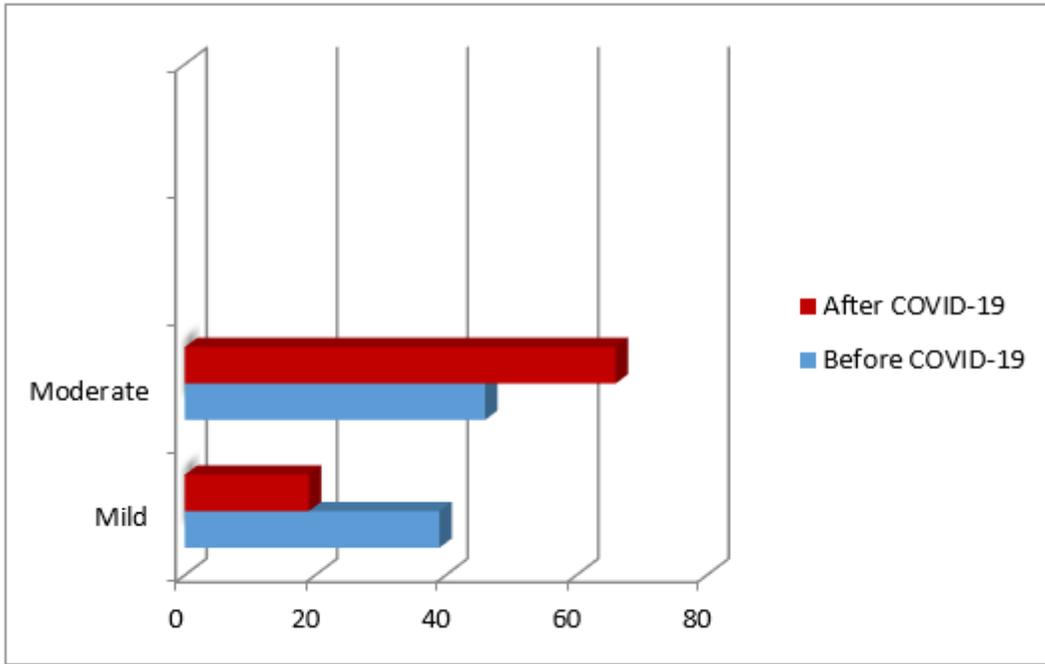
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## Figures



**Figure 1**

Chart No.1: I-PSS categories before and after COVID-19