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Original research article

INTERNATIONAL PROSTATE SYMPTOM SCORE (IPSS) CORRELATION WITH SONOGRAPHIC PROSTATE SIZE

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Abstract: *The International Prostate Symptom Score (IPSS) is a broadly used questionnaire designed to assess the severity of lower urinary tract symptoms (LUTS) in men, particularly those related to harmless prostatic hyperplasia (BPH).* ***Objectives****: The primary aim of this study is to find the International Prostate Symptom Score (IPSS) and its correlation with sonography and prostate size.* ***Methods:*** *This cross-sectional study was conducted at CMH Lahore February 17, 2024, to May 16, 2024. Data were collected from 250 patients. Male patients aged>40 years who presented with LUTS were included in the study. Patients with a history of prostate cancer, bladder dysfunction and prostate surgery were excluded from the study. Data were collected through a systematically designed questionnaire. All the study participants completed the IPSS questionnaire to find the severity and urinary symptoms.* ***Results****: Data were collected from 250 patients according to the study's inclusion criteria. The mean age of the patients was 62.4 ± 8.6 years, and the mean BMI was 27.1 ± 3.2 kg/m2. The mean PSA was 6.8 ± 2.5 ng/mL, and the mean IPSS score was 19.5 ± 6.8. there, 140 (56%) patients were smokers, and 125 (50%) also suffering from hypertension. Patients with IPSS scores ranging from 0-7 exhibited a mean PV of 32.5 ± 5.6 mL, with a Pearson correlation coefficient (r) of 0.25 (p = 0.038). As IPSS scores increased to the 22-35 range, the mean PV rose to 54.3 ± 9.2 mL, with a more robust correlation coefficient of 0.75 (p < 0.001).* ***Conclusion:*** *It is concluded that there is a significant positive correlation between the International Prostate Symptom Score (IPSS) and prostate volume (PV) in patients with benign prostatic hyperplasia (BPH).*

Keywords: Benign Prostatic Hyperplasia, International Prostate Symptom Score, Lower Urinary Tract Symptoms, Prostate Size, Sonography.

Introduction

The International Prostate Symptom Score (IPSS) is a broadly used questionnaire designed to assess the severity of lower urinary tract symptoms (LUTS) in men, particularly those related to harmless prostatic hyperplasia (BPH). These symptoms, including urinary hesitancy, frequency, urgency, weak stream, nocturia, and incomplete emptying, can significantly impact a patient's quality of life. (1). Sonographic evaluation of prostate size is a typical diagnostic tool used to assess BPH and guide treatment decisions. Understanding the correlation between IPSS scores and sonographic prostate size is crucial for clinicians in diagnosing and managing patients with BPH. While IPSS provides subjective information regarding symptom severity, sonographic evaluation offers objective measurements of prostate dimensions, including prostate volume, transition zone volume, and intravesical prostatic protrusion (IPP) (2).

Establishing a correlation between IPSS scores and sonographic findings can aid in risk stratification, treatment selection, and monitoring of disease progression in patients with BPH. (3). Harmless prostatic hyperplasia (BPH) can be characterised as documentable gross or histologic development of prostate glandular tissues, stromal tissues, or both. (4). Usually starting around the age of 40 years, the prevalence of harmless prostatic hyperplasia rises to over half as 90% at the age of 85 years. As life expectancy increases, harmless prostatic hyperplasia will significantly cause dismalness. (5). About half of men with histologically demonstrated BPH have moderate to severe lower urinary tract symptoms (LUTS) that are symptoms related to storage and voiding of urine. (6). A late study shows that an increased number of prostatic veins allows the gland to enlarge, thus explaining why severe urological symptoms are fostered all the more often in smokers who increasingly go through prostate surgery. (7). Trans abdominal sonography is easy to perform and provides reliable measurements of prostate size and its intravesical extension post-void residual volume, allowing simultaneous assessment of the bladder and upper urinary tract. (4). The International Prostate symptom score (IPSS) is prescribed as the symptom-scoring instrument for baseline assessment of symptom severity in men with BPH presenting with lower urinary tract symptoms (LUTS). The Measurement Board of the AUA developed the IPSS. (8).

Previous studies have investigated the relationship between IPSS scores and various parameters of prostate size measured by ultrasound. These investigations have yielded clashing results for certain studies detailing a positive correlation between IPSS scores and prostate volume, while others have tracked down no significant association. Besides, the impact of specific prostate size parameters, such as transition zone volume and IPP, on symptom severity remains a subject of progressing research and

debate. (9)Thus, the primary aim of this study is to find the International Prostate Symptom Score (IPSS) and its correlation with sonography and prostate size.

Methodology

This cross-sectional study was conducted at CMH Lahore from February 17, 2024, to May 16, 2024. Data were collected from 250 patients. Male patients aged>40 years who presented with LUTS were included in the study. Patients with a history of prostate cancer, bladder dysfunction and prostate surgery were excluded from the study. Data were collected through a systematically designed questionnaire. All the study participants completed the IPSS questionnaire to find the severity and urinary symptoms. TRUS were performed to measure the prostate size and related parameters. All the patients underwent transabdominal sonography for the measurement of prostate volume. The urinary bladder was assessed for urine volume, wall thickness, calculi and presence of a tumour. Demographic data, history of disease and all related parameters were also noted. All the patients were evaluated for pre- and post-conditions and pointed out in the questionnaire. Data were analysed using SPSS v26. Pearson 's correlation was applied to find the correlation between prostate volume and other variables. P-values <0.005 were considered significant.

Results

Data were collected from 250 patients according to the study's inclusion criteria. The mean age of the patients was 62.4 ± 8.6 years, and the mean BMI was 27.1 ± 3.2 kg/m^2. The mean PSA was 6.8 ± 2.5 ng/mL, and the mean IPSS score was 19.5 ± 6.8. there, 140 (56%) patients were smokers, and 125 (50%) also suffered from hypertension Table 1)

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Table 1: Demographic data of patients

Characteristic	Frequency (%)
Age (years)	62.4 ± 8.6
BMI (kg/m²)	27.1 ± 3.2
PSA (ng/mL)	6.8 ± 2.5
IPSS Score	19.5 ± 6.8
Prostate Volume (mL)	46.3 ± 15.9
Hypertension	125 (50%)
Diabetes	65 (26%)
Smoking Status	
Non-smoker	140 (56%)
Ex-smoker	60 (24%)
Current smoker	50 (20%)

Patients with IPSS scores ranging from 0-7 exhibited a mean PV of 32.5 ± 5.6 mL, with a Pearson correlation coefficient (r) of 0.25 (p = 0.038). As IPSS scores increased to the 22-35 range, the mean PV rose to 54.3 ± 9.2 mL, accompanied by a more robust correlation coefficient of 0.75 (p < 0.001) (Table 2).

Table 2: Correlation between prostate volume and IPSS score

Range	Number of Patients	Mean Prostate Volume (mL)	Pearson Correlation Coefficient (r)	p-value
0-7	30	32.5 ± 5.6	0.25	0.038
8-14	60	38.2 ± 6.8	0.48	< 0.001
15-21	80	45.6 ± 7.9	0.62	< 0.001
22-35	80	54.3 ± 9.2	0.75	< 0.001

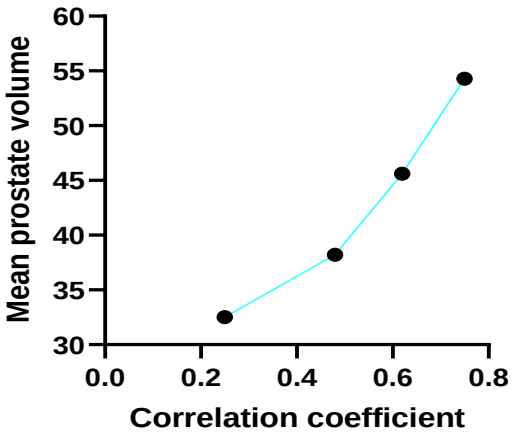

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Figure 1: Correlation Coefficient

Among patients aged < 60 years, the Pearson correlation coefficient (r) was 0.55 ($p < 0.001$), indicating a moderate correlation between IPSS scores and PV. Similarly, patients aged ≥ 60 years exhibited a more robust correlation ($r = 0.72$, $p < 0.001$) between IPSS scores and PV. Furthermore, in patients with PSA levels < 4 ng/mL, the correlation coefficient was 0.60 ($p < 0.001$), while those with PSA levels ≥ 4 ng/mL showed a slightly higher correlation coefficient of 0.68 ($p < 0.001$) (Table 3).

Table 3: Correlation of IPSS score and prostate volume according to age

Age Group	Pearson Correlation Coefficient (r)	p-value
< 60 years	0.55	< 0.001
≥ 60 years	0.72	< 0.001
PSA Level		
< 4 ng/mL	0.60	< 0.001
≥ 4 ng/mL	0.68	< 0.001

Discussion

The observed positive correlation between IPSS scores and prostate volume underscores the clinical relevance of assessing both urinary symptoms and prostate size in patients with benign prostatic hyperplasia (BPH) (10). This correlation suggests that as urinary symptoms worsen, there tends to be an associated increase in prostate volume. This finding aligns with the pathophysiology of BPH, where prostate enlargement can lead to bladder outlet obstruction and subsequent LUTS (11).

The correlation between IPSS scores and prostate volume highlights the diagnostic utility of the IPSS questionnaire in evaluating the severity of urinary symptoms and its association with fundamental prostatic enlargement. Clinicians can use IPSS scores as a screening tool to perceive patients at risk for BPH and focus on additional evaluation, including prostate imaging, in those with higher symptom scores. (12). Understanding the relationship between IPSS scores and prostate volume has implications for treatment decision-making in patients with BPH. For instance, individuals with additional severe urinary symptoms, as reflected by higher IPSS scores, may profit from additional aggressive therapeutic interventions aimed at reducing prostate volume and alleviating bladder outlet obstruction. (13). Conversely, patients with delicate symptoms and smaller prostate volumes may be managed conservatively with watchful waiting or pharmacotherapy. Clinicians can use the correlation between IPSS scores and prostate volume to counsel patients about their disease prognosis and treatment options. (14). Patients with higher IPSS scores and larger prostate volumes may require closer monitoring and more intensive management to forestall disease progression and complications such as acute urinary maintenance or irregular urinary tract infections. Acknowledging the study's limitations, such as its cross-sectional design and potentially baffling variables is essential. (15). Future research should focus on leading longitudinal studies to validate the observed correlation and investigate its prescient value for disease progression and treatment outcomes. Additionally, analysing factors that may impact IPSS scores and prostate volume, such as patient demographics, comorbidities, and lifestyle factors, could give further insights into the confusing interplay between urinary symptoms and prostatic enlargement in BPH.

Conclusion

It is concluded that there is a significant positive correlation between the International Prostate Symptom Score (IPSS) and prostate volume (PV) in patients with benign prostatic hyperplasia (BPH). This correlation can guide treatment decisions, improve risk stratification, and enhance patient counselling, ultimately leading to more effective care for individuals with BPH.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate.

Approved by the department concerned. (CMH/IRB-5452 dated 22-10-23)

Consent for publication

Approved

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Conflict of interest

The authors declared an absence of conflict of interest.

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