Application Visual Prostate Symptoms Score in older men with benign prostatic hyperplasia: a cross-sectional study at a teaching hospital

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ABSTRACT

Introduction: We aimed to evaluate the application of the Visual Prostate Symptoms Score (VPSS) in older men with benign prostatic hyperplasia (BPH), highlighting the question of force stream. ***Methods:*** A cross-sectional study was conducted with 54 older men diagnosed with BPH at a teaching hospital between September 2023 and September 2024. The VPSS and IPSS were completed without assitance. The uroflowmetry parameters and post-void residual (PVR) were recorded. ***Results:*** The mean age was 76.2 ± 15.7 years. Regarding educational level, one-third of the patients went to secondary school or lower. Mean Qmax was 7.2 ± 2.3 mL/s. The mean total IPSS was 18.5 ± 6.9, while the mean VPSS was 9.2 ± 3.5. Most patients realized that the VPSS is easier to understand than the IPSS. Correlation analysis showed that the VPSS was highly correlated with the IPSS (r = 0.79, p = 0.001). Each category of the VPSS, including force stream, frequency, and nocturia, was correlated with the paired category in the IPSS, wherein the force stream had the highest correlation coefficient. The VPSS force stream was correlated with uroflowmetry parameters. ***Conclusion:*** The VPSS is a useful tool for assessing LUTS and is applicable to elderly men. The question of force stream is well correlated with equivalent question in VPSS and uroflowmetry parameters.

Keywords: *Benign prostatic hyperplasia (BPH), correlation, elderly, International Prostate Symptom Score (IPSS), lower urinary tract symptoms (LUTS), Visual Prostate Symptoms Score (VPSS)*

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INTRODUCTION

Benign prostatic hyperplasia (BPH) is a common condition among aging men, often leading to lower urinary tract symptoms (LUTS) that negatively affect the quality of life. An accurate assessment of these symptoms is crucial for effective diagnosis and management. The International Prostate Symptom Score (IPSS) is the most widely used tool for evaluating LUTS severity. However, its reliance on text-based questions may present challenges for older men with lower literacy levels or cognitive decline. To address this limitation, the Visual Prostate Symptoms Score (VPSS) was developed as a pictorial alternative, allowing patients to assess symptoms such as urinary frequency, nocturia, and weak stream more intuitively.

Despite the advantages of the VPSS in terms of simplicity and accessibility, its validity as a substitute for IPSS remains a key area of investigation. Several studies have suggested a potential correlation between the VPSS and IPSS, indicating that the VPSS may serve as a reliable tool for

assessing LUTS severity in older men with BPH. However, the extent of this correlation and its implications in clinical practice require further exploration. Understanding the relationship between these two scoring systems could help determine whether the VPSS can be effectively used as an alternative in elderly populations who may struggle with the conventional IPSS questionnaire.

In daily practice, we re-arranged the images in conventional VPSS and some short questions in Vietnamese to guide patients on how to grade the severity of their symptoms. In this study, we aimed to evaluate the application of the VPSS in older men with BPH, highlighting the question of the force stream.

METHOD

Patients

A cross-sectional study was conducted on 54 older men diagnosed with BPH at a teaching hospital between September 2023 and September 2024. Men with bladder stones, urinary frequency due to diabetes mellitus or diabetes insipidus, history of BPH surgery, urethral stricture, suprapubic catheterization, or neurogenic bladder were excluded from the study. The study was approved by the Institutional Review Board (IRB) of our institution. Informed consent was obtained from all study participants and their guardians before enrollment.

Methods

Patient demographics were collected, including age, educational level, place of residence, prostate volume, Total PSA level, uroflowmetry parameters, PVR, IPSS, and VPSS.

First, the patients were asked to complete the IPSS questionnaires, which were provided by the Vietnamese Nephro-Urological Association. The IPSS questionnaire included seven questions regarding obstruction and irritative symptoms. Subsequently, the VPSS was completed. VPPS is a pictogram created to simplify IPSS using images. In this study, the pictograms were rearranged. The image of the force stream was placed first, followed by daytime frequency and noturia. In addition, a question was added to guide the patients to understand the context and help them complete the questionnaires without assistance.

Uroflowmetry was performed in all patients. The Qmax, Qave, Time to Qmax, and voiding time were recorded. Following uroflowmetry, PVR was measured by a licensed radiologist using ultrasound. The prostate volume was measured using abdominal ultrasound.

Statistical analysis

Statistical analyses were performed using the IBM Statistical Package for the Social Sciences (version 25; IBM Corporation, Chicago, IL, USA). Pearson's Correlation analysis was performed to explore the correlations between variables. A correlation coefficient r ranged from 0.7 to 1 indicates strong correlation; 0.4 to 0.7 indicates moderate correlation; otherwise weak correlation. P values were two-tailed, and a p-value of <0.05 was considered statistically significant.

RESULTS

The mean age was 76.2 ± 15.7 years. Octogenarians accounted for 39% of patients. Regarding educational level, one-third of the patients went to secondary school or lower. Half the patients lived in rural areas. The most frequent chief complaint was a weak urinary stream (37%),

followed by frequency (26%). Mean Qmax was 7.2 ± 2.3 mL/s. The mean total IPSS was 18.5 ± 6.9, while the mean VPSS was 9.2 ± 3.5. Most patients realized that the VPSS is easier to understand than the IPSS. (Table 1)

Table 1. *Patients Demographics (n = 54)*

Variable	n (%) or mean ± SD
Age (mean ± SD)	76.2 ± 15.7
≥65 - 79	33 (61.1)
≥80	21 (38.9)
Educational level	
Secondary school or lower	17 (31.5)
High school or above	37 (68.5)
Place of residence	
Rural	25 (46.3)
Urban	29 (53.7)
Chief complaint	
Urinary retention	5 (9.3)
Weak stream	20 (37.0)
Urgency	7 (13.0)
Frequency	14 (26.0)
Nocturia	6 (11.1)
Hematuria	2 (3.7)
Prostate Volume (mL)	52.4 ± 16.2
Total PSA	7.2 ± 2.3
Q max	11.7 ± 5.2
Time to Q max	7.5 ± 2.1
Voiding time	42.3 ± 23.8
PVR	102.6 ± 72.1
Total IPSS	18.5 ± 6.9
Total VPSS	9.2 ± 3.5
VPSS is easier to understand than IPSS	48(88.89)

VPSS: Visual Prostate Symptom Score; IPSS: International Prostate Symptom Score; PVR: Post void residual; Qmax: Maximum urine flow rate (mL/s)

Correlation analysis showed that the VPSS was highly correlated with the IPSS (r = 0.79, p = 0.001). Each category of the VPSS, including force stream, frequency, and nocturia, was correlated with the paired category in the IPSS, wherein the force stream had the highest correlation coefficient. The VPSS force stream was correlated with uroflowmetry parameters. (Table 2)

Table 2. *Correlation of VPSS with IPSS and uroflowmetry parameters (n =54)*

Variables	Coeffient (r)	p
VPSS and IPSS	0.79	<0.001
VPSS (force stream) and IPSS (weak stream)	0.85	<0.001

VPSS (daytime frequency) and IPSS (daytime frequency)	0.6	<0.001
VPSS (nocturia) and IPSS (nocturia)	0.81	<0.001
VPSS and Qmax	–0.5	0.02
VPSS (force of stream) and Qmax	–0.65	<0.001
VPSS (force of stream) and Qave	–0.7	<0.001
VPSS (force of stream) and Time to Qmax	0.33	0.006
VPSS (force of stream) and Voiding time	0.53	0.005
VPSS (force stream) and PVR	0.21	0.03

VPSS: Visual Prostate Symptom Score; IPSS: International Prostate Symptom Score; PVR: Post void residual; Qmax: Maximum urine flow rate (mL/s); Qave: Avarage urine flow rate (mL/s).

DISCUSSION

Our study showed that elderly men could adapt well to the VPSS to provide information about their lower urinary tract symptoms due to BPH. In addition, the VPSS could be an alternative to the IPSS and uroflowmetry.

The Visual Prostate Symptom Score (VPSS) was developed by Adam E. Groeneveld and colleagues in South Africa [1, 2] as a simplified alternative to the International Prostate Symptom Score (IPSS). The IPSS, which consists of written questions, may pose challenges to individuals with limited literacy skills [3]. In contrast, the VPSS employs visual representations to illustrate key urinary symptoms, including frequency, nocturia, and a weak urinary stream. This pictorial approach facilitates patient self-assessment by minimizing reliance on complex text-based questionnaires, thereby enhancing accessibility and usability, particularly in populations with low literacy levels or language diversity [2]. Elderly people aged 65 years or older are at a risk of frailty and cognitive impairment. Therefore, it may be challenging and time-consuming to complete a survey or questionnaire [4]. Therefore, visual, understable, and short guidance may be a good option. Indeed, most patients in our study reported that the VPSS is easier to complete with IPSS. Other studies also showed that it took more time to complete IPSS than VPSS[2, 4]. Therefore, the VPSS is suitable for use in rural hospitals [5, 6] and public health surveys. In 2022, Chinese colleagues developed an electronic audiovisual version of the VPSS using a mobile application via telemedicine during the Covid-19 pandamic. It was correlated with the VPSS; however, overwheled VPSS correlated with outcomes measured by urologists [7].

Although VPSS is easy for patients to complete, urologists are concerned about its accuracy in assessing LUTS in patients with BPH. Recently, the IPSS has remained the gold standard for quantifying the severity of LUTS due to BPH or other voiding dysfunction-related diseases. Many studies have correlated the VPSS and IPSS and showed that they have a significant relationship [1, 8, 9]. Moreover, some studies have correlated each domain in the VPSS with a paired domain in the IPSS. Among these domains, the force stream and nocturia in the VPSS and weak stream and nocturia in the IPSS seem to have a stronger correlation than others [2, 8]. In clinical practice, we realized that the force stream (question A) was useful and reflected the level of voiding obstruction in patients. Therefore, I focused on correlating this domain with IPSS and

uroflowmetry parameters. A previous study showed that total VPSS correlated with Qmax and Qave, but with a low correlation grade [10]. Our study found that VPSS (force stream) had a moderate-strong relationship with Qmax and Qave, but a moderate-low relationship with time to Qmax and voiding time (Table 2). Although we could not explain this phenomenon, the time to Qmax and voiding time could be affected by the strength of bladder contraction, as well as urethral patency.

Post-void residual (PVR) urine refers to the volume of urine remaining in the bladder following voluntary voiding, and serves as an important clinical indicator of bladder function. Elevated PVR is commonly associated with BPH. We found that the VPSS force stream was weakly correlated with PVR. This is understandable because the elevation of PVR may be due to impaired detrusor contractility and intravesical prostatic protrusion. In addition, to pick the true value of the PVR, the measurement should be performed several times.

We acknowledged the limitations of the present study. First, the lack of a control group may have led to a bias in the conclusion. Second, the Vietnamese version of the VPSS has not been validated yet. However, the visualized nature of the pictogram allows VPSS to be used without a language barrier. Third, some confounders were controlled to determine the true correlation between the VPSS and related factors, such as bladder trabeculation and intravesial prostatic protrusion.

CONCLUSIONS

The VPSS is a useful tool to assess LUTS and is applicable to elderly men. The question of force stream is well correlated with equivalent question in VPSS and uroflowmetry parameters. Additional studies must be conducted to confirm whether the VPSS can replace the IPSS.

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