

Original Article**Correlation between the Visual Prostate Symptom Score and International Prostate Symptom Score in Patients with Symptomatic Benign Prostatic Hyperplasia**

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Abstract**Background**

Benign prostatic hyperplasia affects about 210 million males as of 2010 (6% of the population). BPH is the most common disease of men above 50 years of age. BPH is a major cause of morbidity in the ageing men. Lower urinary tract symptoms, are a collective term for the symptoms of disrupted voiding in males, which has long been associated with BPH.

Materials and Methods

Study was descriptive cross-sectional study conducted in Department of Urology, Nobel medical college, Biratnagar, Nepal over a period from January 2022 to December 2022. The entire Patient with visiting urology clinic of the provisionally diagnosed as BEP was enrolled in the study with approval of institutional review committee.


Results

We enrolled a cohort of 75 patients who had been diagnosed with BEP. The mean age was 51.31 years. The mean prostate size among these individuals was measured to be 45.63 grams, and their mean Prostate-Specific Antigen level was determined to be 3.57. We observed a moderate positive correlation ($r = 0.536$) with statistical significance ($p < 0.01$) between VPSS total and IPSS total. Out of total, 35 (47%) completed VPSS alone without any assistance while filling IPSS only 9 (12%) could complete one. Median time for completing VPSS versus IPSS was 60sec and 300 sec respectively.

Conclusion

In assessment of symptom severity visual prostate symptom score is equally effective as International prostate symptom score in cases of benign prostatic hyperplasia presenting with Lower urinary tract symptoms. All parameters of visual prostate symptom score is significantly correlated with International prostate symptom score.

Keywords: Benign prostatic hyperplasia, Lower urinary tract symptoms, Prostate specific antigen, Quality of life

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Introduction

Most common disease of men above 50 years of age is BPH and it is a major cause of morbidity in the ageing men [1]. Of these, 15% to 30% of males exhibit symptoms [2]. The patient's perception of the severity of the condition, as well as the degree to which it interferes with his lifestyle, should be the primary consideration in choosing therapy [3].

American Urological Association (AUA) symptom index has been adopted by the World Health Organization (WHO) as the IPSS to evaluate the symptom of BPH [4,5]. Other symptom scores are the International Continence Society male questionnaire and the Danish Prostatic Symptom Score, BPH Impact Index –[6, 7, 8].

Van der Waltin developed a Visual Prostatic Symptom Score (VPSS) in 2011 [9]. Study in African and Korean population shows a greater proportion of patient that can be completed VPSS without assistance [10]. In a population with greater language diversity and limited education, VPSS takes significantly less time to complete than IPSS [11].

Uroflowmetry is an office based study but less informative than urodynamics study also known as Pressure flow study (PFS)[12]. PFS is standard for evaluating bladder outlet obstruction due to BPH [13]. The reported side effects include hematuria, urinary tract infection[14].

A study done by Gupta et al showed VPSS is as good as IPSS in assessing symptoms severity "[15]. However, the limitation of study was inadequate sample size and not supporting the general population because the literacy level of Nepal is different in different demography.

Materials and Methods

Study was descriptive cross-sectional study conducted in Department of Urology, Nobel medical college, Biratnagar, Nepal over a period from January 2022 to December 2022. Ethical approval was obtained from IRC department. The entire Patient with LUTS, visiting urology clinic of the provisionally diagnosed as BEP were enrolled in the study. Written informed and understood consent were taken and recorded in pre-set proforma. All male patients with LUTS, provisionally diagnosed as Benign Prostate Hyperplasia were included. Patient refused to give consent, Patients diagnosed or suspected with other causes of LUTS, Patients with indwelling catheter (IDC), Patients with blindness, mental retardation, Patient with comorbidities like hypertension, diabetes, Patient with history of any urological surgery in past were excluded

from the study. From the study done by Gupta et al 2013, Heynset al2012 and 2014 correlation coefficient (r) of IPSS total vs VPSS total showed 0.398, 0.92, 0.845, 0.77 respectively [15,16,17]. On taking mean the average r was 0.73325 with 95% confidence interval and 90% power to estimate the sample size will be as follow:

The minimum sample that was required was 15,

$$n = \left(\frac{Z\alpha + Z\beta}{0.5 \times 1n \left(\frac{1+r}{1-r} \right)} \right)^2 + 3 = 15$$

so we took the entire patient over 1 year period in this study.

The detail History regarding socio-demographic characteristics including age, level of education, income and occupation were taken. All patients were inquired thoroughly regarding LUTS symptoms. Patients were assessed using two symptom scoring systems. Nepali version of IPSS questionnaire and VPSS questionnaire were filled in by the patient after pre testing it by backward and forward translation. Patient was requested to complete the Nepali version of IPSS and VPSS questionnaire simultaneously and time taken to fill the both questionnaires was recorded. We also saw if the patient could fill it solely and waited for 10 seconds. If not filled within 10 seconds they were given assistants to complete the questionnaire. Then this was preceded by physical examination including per abdominal examination. The prostate was examined by Digital Rectal Examination (DRE). The maximum flow rate Qmax, average flow rate Qave and total volume was assessed by Uroflowmetry (Nidhi flow Uroflowmetry 814). This was followed by ultrasonography for total prostate size and PVRU. The serumprostate specific antigen, serum creatinine, urine routine microscopy were recorded.

After filling data in Excel 2010 version, result analysis was done using SPSS version 17.0 Student's t test, Mann-Whitney test and Fisher's exact test, were used for parametric data analysis, nonparametric data analysis and for contingency table analysis respectively. Correlation analysis was done using Spearman's test for nonparametric and Pearson's test for parametric data. P value of < 0.05 was accepted as statistically significant.

Results

In this research study, we enrolled a cohort of 75 patients who had been diagnosed with Benign Prostatic Enlargement (BEP). The mean age of these patients was calculated to be 51.31 years.



The patients reported a median duration of Lower Urinary Tract Symptoms (LUTS) lasting approximately 3 years, with a standard deviation of 1.8 years. Additionally, the mean prostate size among these individuals was measured to be 45.63 grams, and their mean Prostate-Specific Antigen (PSA) level was determined to be 3.57. 53.3% of patients were illiterate while 24% patients had education below 8th grade as shown in the table no1.

Table 1: Education level

Education level	Frequency (n)	Percentage (%)
Illiterate	40	53.3
<8 grades	18	24
8-12 grades	9	12
> grades	8	10.7
Total	75	100

We observed a moderate positive correlation ($r = 0.536$) with statistical significance ($p < 0.01$) between VPSS total and IPSS total. Similarly, when analyzing the correlation between VPSS total and Qmax, a robust negative correlation ($r = -0.557$) emerged, also with a highly significant p-value ($p < 0.01$).

Further analysis extended to the relationship between IPSS total and Qmax, revealing a negative correlation ($r = -0.466$) with a significant p-value ($p < 0.01$). For IPSS subscales, noteworthy positive correlations were found between IPSS frequency and VPSS frequency ($r = 0.371$, $p < 0.01$), IPSS nocturia and VPSS nocturia ($r = 0.859$, $p < 0.01$), and IPSS intermittency and VPSS intermittency ($r = 0.408$, $p < 0.01$).

IPSS incomplete voidance to Qmax, the correlations were found to be weak and non-significant (IPSS incomplete: $r = -0.112$, $p = 0.338$) whereas VPSS to Qmax showed moderate negative correlation ($r = -0.572$, $p < 0.01$).

Table 2: Correlation between VPSS and IPSS

Correlation parameters	Coefficient (r)	P-value
VPSS total Vs. IPSS total	0.536	<0.01
VPSS total vs Qmax	-0.557	<0.01
IPSS total vs Qmax	-0.466	<0.01
IPSS frequency vs VPSS frequency	0.371	<0.01
IPSS nocturia vs VPSS nocturia	0.859	<0.01
IPSS intermittency vs VPSS intermittency	0.408	<0.01
IPSS incomplete voidance vs Qmax	-0.112	0.338
VPSS incomplete voidance vs Qmax	-0.572	<0.01

Out of total, 35 (47%) completed VPSS alone without any assistance. Medical personal had to assist in 40 (53%) of cases. On the other hand, while filling IPSS only 9 (12%) could complete

alone and 66 (88%) required assistance of medical professional. There was significant difference between VPSS and IPSS group ($p < 0.001$)

Table 3: Requirement of assistance while completing IPSS and VPSS

Completion by	IPSS	VPSS	p value
Alone	9	35	<0.001
Assistant	66	40	

While comparing according to literacy, all illiterate required assistant to fill IPSS, while in VPSS could be filled by 8 persons, which was significant ($p = < 0.01$). In literate population only 22% percent required assistant to fill the questionnaire VPSS group whereas 74% percent in IPSS group, which was statistically significant ($p = < 0.001$), as shown in Table 4.

Table 4: Requirement of assistance while completing IPSS and VPSS according to literacy

Completion by	IPSS	VPSS	p value
Illiterate (n=40)			
Alone	0	8	<0.01
Assistant	40	32	
Literate (n=35)			
Alone	9	27	<0.01
Assistant	26	8	

Time to complete IPSS and VPSS showed significant differences. In illiterate as well as literate, IPSS time showed significant difference with VPSS time. Median time for completing VPSS versus IPSS was 60 sec and 300 sec respectively. There was a significant difference between the two groups ($p = < 0.0001$).

Discussion

Still all urologist around the globe use IPSS. It is still considered as the standard form of assessment of patients with LUTS of any cause and of any sex. VPSS concept was based on observation that illiterate men in whom it is impossible to complete IPSS, even with physician assistance. In addition, patient easily understands a visual pictogram showing urinating men, which indicate force of urinary stream corresponding to his own, Q1 in VPSS [4, 9, 11]. The entire patient presenting to urology OPD with LUTS were interviewed. Among them 75 patient who met the inclusion criteria were included in the study. This study was done to see if VPSS is really more effective, easily understandable and quicker to fill than IPSS. The benefit of this study is done in devel-



oping country like Nepal and district like Morang where literacy is low. This study has added benefit to see if really VPSS is more useful in community with low or no educational status. On addition this study helped us to observe the demography of this district.

There are only few studies till date comparing IPSS and VPSS. This study was done to see if really VPSS has advantage over IPSS. We found that with respect to uroflowmetry parameters correlation, both were found to be almost equally effective. But VPSS has benefit that it is easily understood by person with low or no education and has added benefit of less time taken to complete the score. Median time for completing VPSS versus IPSS was 60sec and 300 sec respectively. Mean age of the patient in our study was 51.31 years which was lower to other studies done by CF Heyns et al in 2012 and 2014 CF to be 63.1 years and 56.3 years respectively [10, 11]. Median duration of LUTS was 3 years in our study. It was 15 month (4-60 months) in study done by Gupta et al [15].

In the present study 53.3% had no education at all and nearly 24 % had education below eighth standard. Among illiterate all required assistant to complete IPSS and 80% required assistant to complete VPSS. The statistical analysis demonstrated a highly significant difference in the need for assistance between the two scoring systems. It is similar to study done by Gupta et al [15]. In study done by vanderwalt patient with low education status less than 7 grade, 87% required assistance to complete IPSS and 32 % to complete VPSS. In patient with more than grade 10 education, 24% required assistance to complete IPSS while only 8% to complete VPSS [9].

In our present study IPSS showed negative correlation with uroflowmetry parameters Qmax ($r = -0.466, p < 0.01$). Similar result is seen in study done by Girman et al in analysis of 466 men in 40 – 49 years old and reported negative correlation of IPSS with Qmax but significant ($p < 0.001$) (16). Present study also showed similar result as Gupta et al Qmax ($r = -0.105, p = 0.491$) and Qavg ($r = 0.010, p = 0.946$) (8). In study done by Edwin et al., in 71 men showed mean Qmax of 10.9ml/sec and PVRU of 56ml [17].

In present study VPSS has similar correlation ($r = -0.557, P < 0.01$) with uroflowmetry parameters which is similar to study done by Gupta et al with Qmax ($r = 0.435, p = 0.003$) and Qavg ($r = -0.163, p = 0.284$). In both studies, IPSS showed negative correlation with uroflowmetry parameter. But in study done on 196 men Van Venrooij et al correlated IPSS vs Qmax ($r = -0.12$, not signifi-

cant).

In our present study while comparing VPSS and IPSS, VPSS showed significant positive correlation with IPSS. This is consistent with study done by van der walt [9]. All the specific questions of IPSS related to frequency, nocturia, weak stream and QoL have been positively correlated with the respective component in VPSS.

Conclusion

From our study we found that VPSS is equally effective as IPSS in assessing symptom severity in cases of BPH presenting with LUTS. All parameters of VPSS are significantly correlated with IPSS. VPSS has added advantage over IPSS in terms of need of assistance and time taken to complete the questionnaire and can be completed by illiterate and with lower educational status.

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Conflict of interest

There is no conflict of interest

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