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Comparison between Visual Prostate Symptoms Score and International Prostate Score in Evaluation of Benign Enlargement of Prostate in Tertiary Care Hospital

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Conflict of interest: Nil

Abstract

Introduction: Benign Enlargement of prostate is one of the leading source of health care problem in ageing men around the world. Quantification of lower urinary tract symptoms in patients with BEP is required to initiate and regulate treatment. Both international prostate symptom score and new visual prostate score are used to assess lower urinary tract symptoms in men. The present study was planned to compare these two scores and there efficacy with urodynamic evaluation of patient.

Patients and Methods: With approval of institutional ethical committee this study enrolled 100 patients over a period of 1 year with Benign Enlargement of prostate with lower urinary tract symptoms after obtaining written informed consent. Patient education was noted. All the patients were requested to complete international prostate symptom score and visual prostate score questionnaires, and uroflowmetry parameters were also recorded. The international prostate symptom score and visual prostate score were compared with each other and also with uroflowmetry parameter.

Result: Among the patient enrolled 35% were illiterate. Out of 100 patient 61% required assistance to complete IPSS ($p = <0.001$). Time taken to complete the VPSS was significantly less ($p = <0.001$). Total IPSS is correlated with total VPSS ($R = +0.489$; $p= <0.001$) and total IPSS QOL and total VPSS QOL correlated positive ($R = 0.349$; $p = 0.018$)

Conclusion: Visual prostate score correlates significantly with international prostate symptom score to quantify the lower urinary tract symptoms due to Benign Enlargement

of prostate and it can be completed by a greater number of patient without assistance and in certain period of time.

Keywords: Benign Enlargement of prostate, Lower urinary tract symptoms, Visual prostate score, International prostate symptom score, Uroflowmetry

Introduction

Benign Prostatic Enlargement (BEP), commonly referred to as Benign Prostatic Hyperplasia (BPH), is a non-malignant condition characterized by progressive enlargement of the prostate gland due to hyperplasia of epithelial and smooth muscle cells[1]. It is one of the most prevalent urological disorders affecting ageing men, with histological evidence of prostatic hyperplasia present in approximately 60% of men by the age of 70 years and up to 90% by 80 years[2]. With increasing life expectancy, BEP has become an important public health concern worldwide.

Enlargement of the prostate leads to compression of the prostatic urethra, resulting in bladder outlet obstruction and subsequent lower urinary tract symptoms (LUTS)[3]. These symptoms include both storage symptoms—such as urgency, frequency, nocturia, and incontinence—and voiding symptoms, including hesitancy, weak stream, intermittency, straining, and a sensation of incomplete bladder emptying[4]. LUTS significantly impair quality of life and may result in psychological distress, particularly when symptoms are severe or prolonged.

The severity of LUTS correlates poorly with prostate size and degree of obstruction, emphasizing the subjective nature of symptom perception. Consequently, standardized symptom scoring systems are essential for assessing symptom severity, guiding management, and evaluating treatment outcomes[5]. The International Prostate Symptom Score (IPSS) is the most widely used tool for this purpose; however, it relies heavily on literacy and cognitive comprehension[6]. Several studies have demonstrated that a substantial proportion of patients, particularly elderly men and those with limited education, have difficulty understanding and completing the IPSS accurately, leading to potential reporting bias[7].

To address these limitations, the Visual Prostate Symptom Score (VPSS) was developed using pictorial representations to assess urinary stream, frequency, nocturia, and quality of life. VPSS has been shown to be simple, reliable, and less dependent on literacy, making it particularly suitable for populations with low educational attainment[8]. However, data on its applicability and usefulness in the Nepalese population are lacking.

Given the relatively low literacy rate among elderly men in Nepal and the anticipated rise in BEP prevalence with increasing life expectancy, there is a need to evaluate alternative symptom assessment tools. This study aims to assess the usefulness and applicability of the Visual Prostate Symptom Score in Nepalese men with lower urinary tract symptoms secondary to benign prostatic enlargement.

Materials and methods

The Cross sectional Study was carried out in Urology Unit of Department of Surgery, National Medical College and Teaching Hospital, Birgunj, Nepal from July 2018 to June 2019 after obtaining the ethical clearance from the Institutional Ethics Committee [NMC/301/075/076].

Study sample

Sample Size Calculation

$$n = \frac{Z^2 \times pq}{e^2}$$

Z= 1.96at 95% confidence interval

P= prevalence of BEP = 47.9% [1]

Q= 100-p

e= 10%

n = 96

100 patients were included in the study. All the patients were instructed to fill up the IPSS and VPSS questionnaire.

Inclusion Criteria

- Patients with BEP presenting with LUTS.

Exclusion criteria

- Patients with indwelling catheter (IDC)
- Patients with history of prostatic and/or urethral surgery.
- Patients with urethral stricture or urethritis
- Patients with neurogenic bladder
- Patients with altered creatinine
- Patient with visual impairment, mental retardation
- Patients diagnosed or suspected with other causes of LUTS.

Methodology

All case of BEP with LUTS who met inclusion criteria were included in this study. Informed consent was taken from patient/ guardian. A complete history was recorded in all the cases and detailed general and systemic examination was carried out. Patient's educational status was noted, and the patients were divided into --- groups according to their literacy. Digital rectal examination was performed in every case to assess the size of the prostate, surface, consistency of the gland, and mucosa over the rectal wall. Ultrasonography was carried out in all the cases to measure the prostrate size. All the patients were asked to complete the IPSS comprising the 7 questions. The degrees of severity of these symptoms were noted from 0 to 5. The maximum score in the IPSS is 35.

- The symptoms severity according to score:
- I. Mildly symptomatic: Score from 0 to 7
- II. Moderately symptomatic: Score from 8 to 19
- III. Severely symptomatic: Score from 20 to 35.

A separate question for QoL is present in the IPSS questionnaire, and the degree of impairment of QoL is noted from 0 to 6. The patients, who were unable to complete the questionnaire on their own, were assisted by a doctor. The patients were also requested to complete the VPSS comprising four pictograms to evaluate the symptoms of BEP. The degree of severity of these symptoms is noted from 0 to 6.Maximum score on VPSS is 24 and the symptoms are divided into three categories:

- I. Mildly symptomatic: <8
- II. Moderately symptomatic: 9–16
- III. Severely symptomatic: 17–23.

Uroflometry was done using a Nidhi flow uroflowmeter, 814. Parameter of uroflowmetry measured were voided volume (VV). Qmax, i.e., maximum urine flow rate expressed in ml/s. Qavg, i.e., average urine flow rate expressed in ml/s. This was followed by assessment of PVRU using transabdominal ultrasonography. The IPSS total score and VPSS total score were analyzed with these two uroflowmetry parameters, and their efficacy to quantify the symptoms of LUTS in BEP. Similarly, the individual parameters of these two scoring systems for frequency, nocturia, and straining were also correlated with uroflowmetry parameters, and their correlation values were obtained.

Results

One hundred patients who met inclusion and exclusion criteria who presented with LUTS suggestive of BEP were evaluated

Table 1: Distribution of patients according to age groups

Age (year)	Frequency	Percentage
<70	42	42%
>70	58	58%

Mean Age = 72.1± 7.594

Out of 100 Patients maximum number of patients were in the age group between 70-79 years with total of 48.

Table 2: Patients characteristics and laboratory values

Variable	Mean	Std. Deviation	Range
Prostate Volume on usg	50.71	7.88	35-68
Serum Creatinine	0.97	0.47	0.46-2.98
Serum PSA	2.90	0.79	1.2-4.98

Table 3: Requirement of assistance while completing IPSS and VPSS in different literacy group

		IPSS Completed			VPSS Completed		
Level Of Education		Alone	With assistance	P-value	Alone	With assistance	P-value
	>9TH	29	11	<0.001	33	7	<0.001
	<9TH	10	21		26	5	
	Illite-rate	0	29		6	23	

Among the 100 patients who required assistance of medical personnel to fill up IPSS were 61 % of which all 29 % illiterate patients needed assistance. On the other hand 35 % of patients were able to complete VPSS and only 23% of the cases required assistance among the illiterate group. In literate population only 12% needed assistance to complete VPSS.

Table 4: Time required to complete IPSS and VPSS

Questionnaires	Time Taken (sec)	Median	Std. Deviation	P-value
IPSS	294 (200 - 400)	300	52.108	0.071
VPSS	128 (60 - 180)	130	34.692	

Completion time for IPSS and VPSS showed significant differences. Mean time for completing VPSS was 2 min 8 sec and for IPSS was 4 min and 54 sec ($p < 0.001$)

Table 5: Correlation of IPSS and VPSS

Statistics	IPSS Score	VPSS Score	P-value
Mean	15.6	9.59	<0.001
Median	15	9	
Standard Deviation	5.3	2.768	

Mean IPSS in the patients was 15.60 ± 5.33 with mean IPSS Qol of 4.03± 1.560. Mean VPSS was 9.59±2.786 with mean VPSS Qol 3.71± 1.5. IPSS had significant correlation with VPSS ($p<0.001$)

Table 6: Uroflowmetry parameters

Uroflowmetry Parameters	Mean	Std. Deviation
Voided Volume	219.46	53.322
Qmax	11.44	3.023
Qavg	6.625	1.649
PVRU	89.48	29.573

Uroflowmetry study showed median voided volume of 200ml, Qmax of 10ml/s and Qavg of 6.25ml/s. Post procedure PVRU of 88ml.

Table 7: Spearman's correlation of IPSS and VPSS

Group	Correlation Coefficient (r)	P-value
IPSS total vs VPSS total	0.489	<0.0001
IPSS total vs Qmax	-0.120	0.072
VPSS total vs Qmax	-0.136	0.333
IPSS total vs Qavg	-0.068	<0.0001
VPSS total vs Qavg	-0.180	0.578
VPSS total vs VPSS Qol	0.395	0.208
IPSS Qol vs VPSS Qol	0.349	0.018
IPSS total vs IPSS Qol	0.584	<0.0001
Frequency: VPSS Q2 vs IPSS Q2	0.432	<0.001
Nocturia: VPSS Q3 vs IPSS Q7	0.369	0.079
Poor stream: VPSS Q1 vs IPSS Q5	0.381	0.027
Poor stream: IPSS Q5 vs Qmax	-0.108	0.391
Poor stream: VPSS Q1 vs Qmax	-0.207	0.968
Age vs Total IPSS	-0.335	0.261
Age vs Total VPSS	-0.153	0.003
Prostate Volume vs Total IPSS	0.118	0.020
Prostate Volume vs Total VPSS	0.002	0.195
Age vs Prostate Volume	-0.092	0.183

Age related significantly with VPSS (r -0.153; p=0.003) but failed to do so with IPSS (r-0.335; p=0.261). Total IPSS and total VPSS showed significant positive correlation (r= =+0.489: p<0.001).

Questions on frequency in VPSS Q2 and IPSS Q2 had positive correlation which was significant (r+0.432; p<0.002). Questions on poor stream VPSS Q1 and IPSS Q5 had significant relation with positive correlation (r+0.381;p=0.027). However, there was positive correlation between nocturia VPSS Q3 and IPSS Q7 with no significance (r+0.369; p=0.079). Also, total IPSS and total VPSS had negative correlation with Qmax though

the result was not significant (p =0.072 and p=0.333).There was negative correlation with significance between IPSS total and Qavg (r-0.068; p<0.001). However, VPSS total and Qavg was inversely related with no significance (r-0.180; p=0.578).

Notably, IPSS Qol had positive correlation with VPSS Qol and had significant result (r+0.349; p=0.018).

Discussion

The IPSS is used as a tool to assess LUTS in male patients[1]. It was designed to be self-administered by patients without assistance of an attendance. Studies had shown that low level of education were main drawbacks for completions of questionnaire[2]. Patients and even the assistance may misinterpret the questionnaires resulting in a biased score, which will lead to inappropriate management. A simple tool, the VPSS questionnaires address the problem of misinterpretation by using the pictogram to illustrate each question[8].

BEP is common in old age. In present study, most of the patient were in seventies (48%) followed by sixties (36%). This is consistent with the literature which showed the incidence to be greater than 50%in there sixties and up to 90% by age 85[3,4]. In the present study age showed significant relation with VPSS.

Literacy plays significant role in assessment of patient with symptoms score. In several studies Illiteracy and low level of education was seen to be major drawback for the administration of questionnairs[2]. In one of study in South Africa Van der walt et al found about one third of population to have education below 7th standard and 4.2% were illiterate while evaluating patients with IPSS and VPSS[8]. The literacy rate in Nepal in male is nearly 75%. In present study 29% of patients were illiterate and 31% had education below 9th grade, and 40% had education above 9th standard. Among illiterate 80% required assistance to fill up VPSS and 100% patients required assistance to complete IPSS. In the study by Van der Walt, patient with low education status of < 7 standard 87% required assistance to complete IPSS and 30% to complete VPSS among 100 patient 61% required assistance and only 35% required assistance to complete VPSS.(P=<0.001). In a study by Ceylan et al which compared IPSS and VPSS in Turkish people found that VPSS was more realiable in low education status patients[2].

In this study result were consistent with other studies that VPSS may prove as an alternative tool in assessment of LUTS in a population with diversity in educational, cultural or language background. Selekman et al found that the VPSS questionnaire was more useful in evaluation of LUTS in patient with lower education status[2].

In one of the study VPSS can be completed without assistance by a greater proportion of illiterate men, 68% in VPSS vs 13% in IPSS. The VPSS pictogram was modified to make it easier for patient to understand in subsequent study[13]. Several studies recently from different countries confirmed that the VPSS score has a significant correlation with IPSS and may also be useful in longitudinal follow up.

Time consumption while completing symptoms score is an important consideration, especially in OPD setting. In present study time taken in completion of VPSS was significantly less when compared with IPSS (P= <0.001).This was similar to a study by Wessels SG et al[2].

In present study Mean IPSS was 15.6 ±SD 5.33. According to IPSS categorization majority of patients had moderate symptoms. This was possibly due to patients were evaluated in outdoor settings and some patients

were under regular medications for BEP. Those who were managed surgically had higher IPSS score.

Mean VPSS in present study was 9.59 ± SD 2.786. Till date, few studies have been done to evaluate VPSS in LUTS with urethral stricture and BEP. However VPSS value was not mentioned in both[14]. Park et al found the VPSS may be used in evaluation of LUTS at initial and follow up visits[2].

Pressure flow study is the gold standard in evaluation of bladder outlet obstruction. However, it's not feasible in all patients and simple methods of uroflometry are convenient and can be correlated with symptoms. Uroflometry parameter and PVRU measurement are simpler than urodynamic study (UDS) and is also recommended by the European Urology Society (EAU) for use of initial evaluation. In a study by Wadie et al, mean Q max was 11.8 ml/s with Qave of 6.07ml/s and PVRU of 43.3 ml[15]. EL Din Ke et al studied 71 men and showed mean Qmax of 10.9 ml/s and PVRU OF 56 ML[2]. In present study, uroflowmetry findings were similar with mean Qmax 11.44 ml/s with Qavg6.625ml/s with mean PVRU 89.48 ml.

The correlation of IPSS parameters has been largely studied, Asutosh Roy et al in his study found IPSS score increase with increasing severity of LUTS[7]. Girman et al performed an analysis of 466 men of 40-79 yrs old, and reported significant negative correlation with Qmax ($P<0.001$)[2].

Wadie et al also found that total IPSS versus Qmax (0.10, $P<0.04$) and total IPSSS versus Qavg (0.10 $P<0.01$)[15]. IPSS had similar correlations with uroflowmetry parameter. Heyns et al proposed that IPSS and Qmax ($r= -0.38$, $P<0.002$) and the VPSS and Qavg ($r=-0.37$, $P<0.003$) were negatively correlates with each other[2].

In present study IPSS reveled negative correlation with uroflowmetry parameters. However, the correlations were weak and not significant. There was certain drawbacks of uroflowmetry and reading requires continuous evaluation for measurement error and reading errors. Few prerequisites need for the evaluation. As a standard, at least two reading are necessary. The voiding process should mimic patient real voiding pattern. However, uroflowmetry and Qmax lacks specificity for the reliable urodynamic diagnosis, and evaluated PVRU is weekly associated with bladder outlet obstruction[1]. In a study of 196 men Van venrooij et al correlated IPSS verses Qmax ($r=0.12$)[3], K. Ezz el Din et al established that the correlations between objective noninvasive parameters of LUTS is weak[16].

In present study, VPSS showed negative correlation which was not significant. In a study by Vaan der walt et al there was a positive correlation between total IPSS and total VPSS ($r=0.73, P<0.01$)[8]. Heyn et al also showed positive correlations between the IPSS and VPSS ($r=+0.62$, $P<0.001$)[18]. Afriyanash et al[4] and Tareja et al[5] also had similar finding.

In a present study VPSS showed positive correlations with IPSS and result were significant ($r=+0.989$, $P<0.0001$). Questionnaires in IPSS and VPSS were found comparable on frequency (VPSS Q2 VS IPSS Q2), nocturia (VPPS Q3 VS IPSS Q7) and weak stream (VPSS Q1 VS IPSS Q5) and had positive correlation and result were significant and result were consistent with study of Afriyanash et al[21], Heyns et al[18] and Tereja et al[22].

Conclusion

VPSS is as good as IPSS in assessing symptoms severity in cases of LUTS due to BEP. It can be completed by a greater number of patients without assistance and in shorter period of time.

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