Original article

Visual prostate symptom score (VPSS). Is it an effective alternative for the assessment of lower urinary tract symptoms? Experience in a reference center in southeastern Mexico

Visual Prostate Symptom Score (VPSS). ¿Es una alternativa eficaz para la evaluación de los síntomas del tracto urinario inferior? Experiencia en un centro de referencia en el sureste de México

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Abstract

The International Prostate Symptom Score (IPSS) assesses lower urinary tract symptoms (LUTS). In our Department, we receive Mayan-speaking patients with low educational levels, which makes it difficult for them to understand the questionnaire. The visual prostate symptom score (VPSS) overcomes these barriers.

Objectives: To correlate the VPSS score with the IPSS one, in patients with LUTS who attend the Urology Department of the Hospital Regional de Alta Especialidad, to determine the prevalence of patients requiring assistance in answering both instruments. The correlation between the IPSS and VPSS and the Qmax of these patients will be evaluated.

Material and methods: A comparative cross-sectional study was performed in men of 40 years of age or older with LUTS, between January 2019 to January 2020. Uroflowmetry was performed and the VPSS and IPSS were applied to them, identifying those who required help to answer the questions. Pearson or Spearman correlation tests were performed according to the distribution of the data, evaluated using the Kolmogorov-Smirnov test. Categorical variables were compared using X^2 or Fischer's test.

Results: Eighty-one men with LUTS were included. The mean age was 62.89+9.52. A significant correlation was found between total VPSS and total IPSS (r=0.708, p<0.001). 83.8% (n=67) of patients were able to answer the IPSS, and 98.8% (n=79) were able to answer the VPSS. The percentage of patients who required help to solve the IPSS was 43.5% (n=34) and the VPSS was 25% (n=20). No significant correlations were found between VPSS and Qmax (r=-.123, p=0.277), and IPSS and Qmax (r=-0.085, p=0.456).

Conclusions: The VPSS is a useful instrument in the assessment of LUTS, as it correlates with the IPSS. It also overcomes the barriers of language and educational level. However, it overestimates the severity of the symptoms referred by the patient. Then, studies are needed to improve this instrument

Key words:
Lower urinary tract symptoms (LUTS), Visual Prostate Symptom Score (VPSS), International Prostate Symptom Score (IPSS)

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Resumen

El *International Prostate Symptom Score* (IPSS) evalúa los síntomas del tracto urinario bajo (STUB). En nuestro departamento recibimos pacientes hablantes de maya con bajo nivel educativo, lo que les dificulta la comprensión del cuestionario. El *Visual Prostate Symptom Score* (VPSS) supera estas barreras.

Objetivos: Correlacionar el puntaje VPSS con el IPSS, en pacientes con STUB que acuden al Servicio de Urología del Hospital Regional de Alta Especialidad, para determinar la prevalencia de pacientes que requieren ayuda para contestar ambos instrumentos. Se evaluará la correlación entre el IPSS y VPSS y el Qmax de estos pacientes.

Material y métodos: Se realizó un estudio transversal comparativo en hombres de 40 años o más con STUB, entre enero de 2019 a enero de 2020. Se les realizó uroflujometría y se les aplicó el VPSS y el IPSS, identificando aquellos que requirieron ayuda para responder a las preguntas. Se realizaron pruebas de correlación de Pearson o Spearman según la distribución de los datos, evaluada mediante la prueba de Kolmogorov-Smirnov. Las variables categóricas se compararon mediante X^2 o la prueba de Fischer.

Resultados: Se incluyeron 81 hombres con STUB. La edad media fue de 62.89+9.52. Se encontró una correlación significativa entre el VPSS total y el IPSS total (r=0.708, p<0.001). El 83.8% (n=67) de los pacientes pudo responder el IPSS y el 98.8% (n=79) pudo responder el VPSS. El porcentaje de pacientes que requirieron ayuda para resolver el IPSS fue del 43.5% (n=34) y el VPSS del 25% (n=20). No se encontraron correlaciones significativas entre VPSS y Qmax (r=-.123, p=0.277), e IPSS y Qmax (r=-0.085, p=0.456).

Conclusiones: El VPSS es un instrumento útil en la evaluación de STUB, ya que se correlaciona con el IPSS. También supera las barreras del idioma y el nivel educativo. Sin embargo, sobreestima la gravedad de los síntomas referidos por el paciente. Entonces, se necesitan estudios para mejorar este instrumento.

Palabras clave:
Síntomas del tracto urinario bajo (STUB), Visual Prostate Symptom Score (VPSS), International Prostate Symptom Score (IPSS)

Introduction

Prostatic hyperplasia is one of the urological diseases that most affects the male population. [1] So, it is of vital importance to adequately address this pathology. It is characterized by benign growth of prostatic tissue around the urethra. Which, eventually leads to decreased urethral opening. Resulting in obstruction of urine outflow, leading to lower urinary tract

symptoms (LUTS).[2] The International Continence Society has divided the above symptoms into three categories related to voiding, storage and postvoiding. Obstructive voiding symptoms include difficulty initiating micturition, intermittency, decreased urinary stream caliber and terminal dribbling. For the study of prostatic hyperplasia, the IPSS was developed by the American Urological Association (AUA) (Figure 1), which has been validated in several languages and has been taken as part of a comprehensive approach by the World Health Organization (WHO). It consists of 8 questions, the eighth of which refers to quality of life. Each question, which assesses a combination of urinary storage and voiding symptoms, allows the patient to choose answers from 1 to 6 on a scale of severity of a particular symptom and the answers are assigned points from 0 to 5. The total score ranges from 0 to 35, such that patients with scores of 0-7 are considered to have mild LUTS, 8-19 moderate and 20-35 severe.[3,4]

Figure 1. International Prostate Symptom Score (IPSS)

Patient Name: _____ **Date of birth:** _____ **Date completed** _____

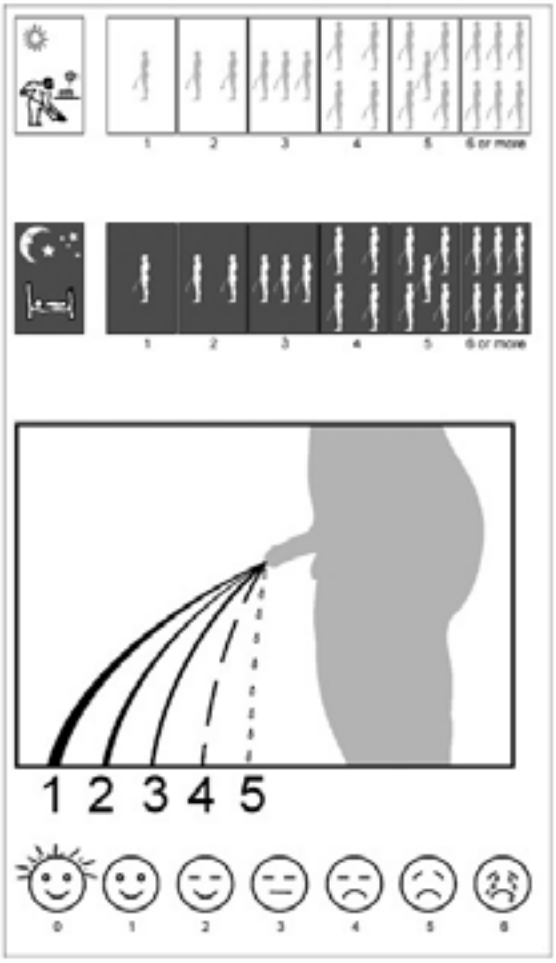
In the past month:	Not at All	Less than 1 in 5 Times	Less than Half the Time	About Half the Time	More than Half the Time	Almost Always	Your score
1. Incomplete Emptying How often have you had the sensation of not emptying your bladder?	0	1	2	3	4	5	
2. Frequency How often have you had to urinate less than every two hours?	0	1	2	3	4	5	
3. Intermittency How often have you found you stopped and started again several times when you urinated?	0	1	2	3	4	5	
4. Urgency How often have you found it difficult to postpone urination?	0	1	2	3	4	5	
5. Weak Stream How often have you had a weak urinary stream?	0	1	2	3	4	5	
6. Straining How often have you had to strain to start urination?	0	1	2	3	4	5	
	None	**1 Time**	**2 Times**	**3 Times**	**4 Times**	**5 Times**	
7. Nocturia How many times did you typically get up at night to urinate?	0	1	2	3	4	5	
Total I-PSS Score							

Score: 1-7: *Mild* 8-19: *Moderate* 20-35: *Severe*

Quality of Life Due to Urinary Symptoms	Delighted	Pleased	Mostly Satisfied	Mixed	Mostly Dissatisfied	Unhappy	Terrible
If you were to spend the rest of your life with your urinary condition just the way it is now, how would you feel about that?	**0**	**1**	**2**	**3**	**4**	**5**	**6**

Given the apparent difficulty experienced by many patients in responding the IPSS, in 2011 Van Der Walt *et al*. developed a visual prostate symptom scale, the VPSS (Figure 2**)**, which assesses daytime and nighttime urinary frequency, urinary stream characteristics and the patient's overall quality of life.[5] This scale classifies prostatic symptoms as mild (1-3), moderate (4-9) and severe (10-17).

Figure 2. Visual Prostate Symptom Score (VPSS)



During the application of the IPSS to patients who come to our service, the degree of difficulty that a large proportion of them has answering the questions that this scale represents stands out. This may be due, in large part, to the high number of patients who speak Maya, to the small proportion of people with basic education and to the marginal situation of the patients attended in this service.

Our objective is to correlate the VPSS score with the IPSS in patients with LUTS attending the Urology service of *Hospital Regional de Alta Especialidad de la Península de Yucatán*. In addition, to determine the prevalence of patients who require assistance in answering the IPSS and VPSS; to measure the Qmax of these patients and to correlate this with the IPSS and VPSS scores.

Material and methods

Comparative and cross-sectional study of men over 40 years of age attending urology outpatient care for lower urinary tract symptoms (LUTS). A non-probabilistic sampling was used, following the method of Cervantes6, which states that 10 subjects per item should be sampled, for instruments with less than 10 items. Therefore, our sample was based on the 8 items of the IPSS.

The inclusion criteria were as follows: men over 40 years of age with LUTS who attended consultation between January 2019 and January 2020 and who agreed to participate in the study. The exclusion criteria were: patients with cognitive deficit, psychiatric disorders, visual deficit, illiterate, bladder capacity under 150 cc, underactive bladders, permanent bladder catheterization or active cystostomy or UTI status, and patients who failed to emit at least 150 cc in uroflowmetry.

A questionnaire was given to the candidates to determine their clinical and sociodemographic variables. Subsequently, the VPSS and IPSS were applied to evaluate the LUTS, and the patients who required help in answering them were identified. All patients underwent uroflowmetry with urodynamic and uroflowmetry equipment (NEC MultiSync), taking a minimum volume of 150 mL into account, voiding desire was stimulated through intentional water intake (1 Lt), and the peak flow rate was determined automatically by the uroflowmetry equipment (Qmax).

Statistical analysis was performed with the SPSS, v.25 package (IBM, Illinois, USA). The distribution of the data was determined using the Kolmogorov-Sminrnov normality test. The Pearson or Spearman correlation tests were used as appropriate, and categorical variables were compared using the X^2 test or the Fischer's test. Values of $p<0.05$ were considered significant.

Results

We included 81 patients who attended our center for lower urinary tract symptoms with a mean age of 62.89+9.52 years. With regard to their level of education, we found that 15% (n=12) had only primary education, 18.8% (n=15) had secondary education, 11.3% (n=9) had high school, 25% (n=20) had higher education and 30% (n=24) of the patients only knew how to read and write. With respect to the patients' native language, 86.3% (n=69) spoke spanish and 13.8% (n=11) spoke mayan. Regarding the comorbidities of the patients, 12.5% (n=10) reported having diabetes type 2, and 33.8% (n=27) reported having arterial hypertension.

In reference to the results obtained in the IPSS and VPSS, the following can be said. The median of the IPSS was 14 (10-23) and the median of the VPSS was 14 (12-17). The IPSS question in which most help was reported was number 1 with 38.8% (n=31), and second place, question 2 with 26% (n=32.5). Regarding the VPSS the question in which patients required help the most was in number 1 with 22.5% (n=18), and in second place questions 3 and 4 with % (n=4) for both. (Table 1)

Table 1. Patients who required assistance to answer IPSS and VPSS

IPSS	Score	Patients who required assistance *n*, (%)	VPSS	Score	Patients who required assistance *n*, (%)
IPSS-Total	14 (10–23)	18 (22.5)	VPSS Total	14 (12–17)	
IPSS-1	3 (1–4)	31 (38.8)	VPSS-1	5 (4–6)	18 (22.5)
IPSS-2	2.5 (0–5)	26 (32.5)	VPSS-2	3 (2–4)	3 (3.8)
IPSS-3	3 (1–5)	25 (31.3)	VPSS-3	3 (3–4)	4 (5)
IPSS-4	1 (0–4)	25 (31.3)	VPSS-4	3 (2–4)	4 (5)

Continúa

IPSS	Score	Patients who required assistance *n*, (%)	VPSS	Score	Patients who required assistance *n*, (%)
IPSS-5	2 (0–4)	24 (30)			
IPSS-6	1 (0–3)	19 (23.8)			
IPSS-7	3 (2–4)	20 (25)			
IPSS-8	4 (3–4)	21 (26.3)			

The VPSS total score was significantly correlated to the IPSS total score (r=0.708, p<0.001).

Regarding the percentage of patients who were able to answer the IPSS, it was observed that 83.8% (n=67) were able to answer the questionnaire; the percentage who required help to answer it was 43.5% (n=34); and 33.8% (n=27) reported the questionnaire as difficult. The main reasons for needing help in answering the questionnaire were: not speaking Spanish (1.3%) and not understanding the content (33.8%). In addition, schooling was significantly associated with the patient being able to answer the IPSS, asking for help to answer it and finding this questionnaire difficult (p<0.001). A significant association was found with asking for help (p=0.001) and finding the questionnaire difficult to answer (p=0.004). Regarding this questionnaire, it was reported that 98.8% (n=79) were able to answer it, 25% (n=20) required help to answer it, and only 7.5% (n=6) found this tool difficult. (Table 2)

Table 2. Difficulty reported by patients when answering IPSS and VPSS

Instrument	Did the patient require assistance? *n, (%)*	Was the patient able to answer? *n, (%)*	Did the pantient find it difficult? *n, (%)*
IPSS	34 (43.5)	67 (83.8)	27 (33.8)
VPSS	20 (25)	79 (98.8)	6 (7.5)

Tests of association were performed with respect to whether patients were able to answer both questionnaires, where a significant correlation was found (p=0.022); and to whether patients needed help to solve the questionnaires, also obtaining a significant correlation (p<0.001); and finally, to whether patients had found these questionnaires difficult, observing a significant association (p<0.001).

The median Qmax, voiding time, voided volume, initial volume, and residual volume were 13.8 (10.3–19.8) ml/s, 40 (34–54.3) sec, 230.5 (180–350) ml, 249 (190.8–332) cc and 49.4 (18–97.2) cc, respectively. No significant correlation was found between VPSS and Qmax (r=-.123, p=0.277) or between IPSS and Qmax (r=-0.085, p=0.456). (Table 3)

Table 3. Uroflowmetry resuts

Uroflowmetry results	
Qmax (ml/s)	13.8 (10.3–19.8)
Emptying time (S)	40 (34–54.3)
Volume emptied (ml)	230.5 (180–350)
Initial volume (cc)	249 (190.8–332)
Residual volume (cc)	49.4 (18–97.2)

The hierarchical ranking of VPSS and IPSS symptom intensity is summarized in Table 4.

Table 4. Grades of severity according to IPSS and VPSS

	IPSS	VPSS	P
Mild n, (%)	16 (20)	0	ND
Moderate n, (%)	33 (41.3)	3 (3.8)	0.766
Severe n, (%)	31 (38.8)	77 (96.3)	0.160

Discussion

The application of the IPSS is part of the approach to patients with LUTS. However, the degree of difficulty that a large proportion of patients have in answering the questions contained in this instrument stands out; this may be due, in large part, to the high prevalence of patients who speak mayan, to the low proportion of people with basic education and to the marginalized situation of the patients seen in this service.

Because of the problems faced by patients when answering the internationally suggested scale and to the bias that is induced when answering it with help, the VPSS was developed, which, since its creation, has shown good results when assessing patients with LUTS in a simpler and much more satisfactory way.

There are studies that support the argument that answering the IPSS sometimes represents a challenge for patients with low educational level, such as the one published by Selekman *et al.*[6] Said study concluded that when patients receive help to answer the IPSS, the results show alterations; and also, that there were fewer alterations in the answers when using the VPSS. This suggests that the VPSS is useful in the determination of LUTS, particularly in patients with limited education. In our study, the fact that schooling is significantly associated with being able to answer the IPSS stands out, otherwise, patients need to request help to complete this instrument and they consider it difficult to solve, whereas, with the VPSS, schooling was not significantly associated with answering it. We can conclude that the educational level of the patients to whom the VPSS is applied does not matter, since they will be able to answer it satisfactorily.

The results of our study, with respect to the IPSS and VPSS correlating significantly, are in agreement with other published studies, such as the one carried out by Roy *et al.*[4] In which a comparison was made between the two scales, and they concluded that the VPSS correlates significantly with the IPSS for quantifying LUTS due to benign prostatic hyperplasia. According to said study, the VPSS can be used instead of the IPSS for the assessment of symptom severity in men with LUTS, who are illiterate or have limited education. Similarly, in Turkey, Ceylan *et al.*[7] made a comparison between the two scales, where they concluded that the VPSS is an easily applicable and understandable scale in the assessment of lower urinary tract symptoms in patients with obstructive data. The VPSS also correlated signifi-

cantly with the IPSS and can be used in elderly and poorly educated patients.

A result in our study that does not coincide with what has been published about these two scales, is that we did not find a significant correlation between VPSS and Qmax, nor between IPSS and Qmax; as in the study published by Setthawong *et al.*[8] where VPSS did have a statistically significant correlation with uroflowmetry rate, residual urine and prostate size than IPSS.

When classifying patients as mild, moderate, and severe, in terms of their symptomatology, we found patients with mild symptoms in the IPSS, while with the VPSS we didn't find patients classified as such. As for moderate symptomatology, we did find patients who were classified as moderate, when applying the VPSS. However, the number was considerably lower, compared to the patients classified as such by the IPSS. Finally, most patients were classified as having severe symptomatology when assessed by the VPSS, whereas only 38.8% were assigned to this category by the IPSS. From this result, we can conclude that the VPSS may probably overstages patients, and that more studies are needed to improve this tool.

Conclusion

The VPSS is a useful instrument in the assessment of LUTS since it correlates with the IPSS. It also overcomes language barriers and educational level. However, it is possible that it overestimates the severity of the symptoms referred by the patient, so more studies are needed to improve this instrument.

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Conflict of interest:

The authors declare no conflicts of interest.

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