Original Article

Correlation between Physician-Administered International Prostate Symptoms Score and Peak Urine Flow Rate in Assessment of Benign Prostatic Enlargement Patients

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Abstract

Background: To determine the correlation between international prostate symptom score (IPSS) questionnaire, completed by benign prostatic enlargement patients with the aid of their physicians and the peak urine flow rate from uroflowmetry. **Materials and Methods:** This was a prospective study carried out over a period of one year (which year and which period). IPSS questionnaire was administered, and uroflowmetry done for 76 consecutive patients from urology clinic of University of Nigeria Teaching Hospital (UNTH) who consented to the study. **Results:** Seventy-six patients were recruited for the study. The mean age of the patients was 63.53 ± 9.84. Using the international prostate symptom score to assess symptoms severity, 16 patients had mild symptoms, 36 patients had moderate symptoms, while 24 patients had severe symptoms. The means quality-of-life score was 4.42 ± 1.83. Fifty-eight patients had obstructed peak flow rate (Qmax) on uroflowmetry, 14 patients had equivocal Qmax, while 4 patients had normal Qmax. Statistically significant, negative medium correlations were observed between Qmax and total IPSS, Qmax and the IPSS voiding and storage subscores, as well as Qmax and disease specific quality-of-life score (QoL). **Conclusion:** There is a statistically significant medium negative correlation between total IPSS and Qmax. This negative medium correlation was also observed between Qmax and IPSS subscores and between Qmax and QoL.

Keywords: *Benign prostatic enlargement, international prostate symptom score, lower urinary tract symptoms, uroflowmetry*

Introduction

Benign prostatic hyperplasia (BPH) is a pathological condition in which both the glandular and stromal elements of the prostate increase in number.[1] It usually arises from the transitional zone and peri-urethral glands.[1,2] This hyperplasia may result in prostatic enlargement which is observed clinically as benign prostatic enlargement (BPE) as well as increased resistance to urine outflow from the bladder aged 50 years, and 90% of men above 80 year have histologic evidence of BPH.[3]

The commonest clinical presentation of BPH is lower urinary tract symptoms (LUTS).

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Bladder outlet obstruction due to benign prostatic enlargement is common in southeastern Nigeria with a reported prevalence of 25.3% from a population-based study.[4]

Evaluation of BPE patients involves the use of validated questionnaire such as the IPSS and uroflow studies.[5-7] IPSS is a self-administered questionnaire. The ability to complete the IPSS unaided depends on

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patients' comprehension of the language of the IPSS[8] as well as his level of education.[9] In our environment, the IPSS is usually administered with the help of a physician.[10]

Peak urine flow rate (Qmax) correlates well with the degree of infra-vesical obstruction.[11,12] Thus, Qmax is used in assessment of bladder outlet obstruction due to BPE in both clinical trial and practice.[5,6]

While there are studies comparing IPSS and Qmax, there are limited studies comparing IPSS as administered by a physician and Qmax in our environment.

This work studied the relationship between the IPSS as administered with the help of a physician and peak urine flow rate in patients presenting with lower urinary tract symptoms (LUTS) due to BPE. It also studied the relationship between IPSS voiding and storage subscores and peak urine flow rate as well as the relationship between IPSS global impact on QoL and peak urine flow rate.

Patients and Methods

This was a prospective hospital-based study that evaluated the correlation between Qmax and IPSS, Qmax and IPSS subscore as well as Qmax and QoL score.

The study was carried out over a period of 12 months, and 76 patients were recruited for the sturdy. Ethical clearance was obtained from the hospital ethical committee. Informed consent was from patients recruited for the study. The patients were men aged 50 years and above who presented for initial evaluation of their LUTS resulting from BPE. The diagnosis of BPE was made from clinical history of LUTS, digital rectal examination finding of enlarged prostate with benign features, and ultrasound showing benign features and normal PSA level (0-4 ng/ml). Prostate biopsy was performed to rule out prostate cancer for PSA above 4 ng/ml.

All patients with LUTS from BPE who consented to the study were evaluated using clinical history, digital rectal examination, IPSS, PSA total and free and uroflowmetry. Educational level of all patients was ascertained.

Patients whose clinical history suggested urethral stricture were further evaluated using retrograde urethrogram, while those patients with abnormal DRE finding, total PSA above 4, and percentage free PSA below 25% were further evaluated using prostate biopsy.

The following patients were excluded from the study: carcinoma of the prostate patients; BPE patients who were already on 5α reductase inhibitors or α receptor blockers or both drugs in combination, or saw palmetto extracts; patients with urethral stricture; patients with diabetes mellitus, cerebrovascular accident, or Parkinson's disease.

The IPSS questionnaire was administered to the patients by a single physician to ensure uniformity. Uroflow studies, using NIDHI *flow*-814, were done for the patient by a hospital technician. Voided volume above 100 mls was accepted as valid for the study.[13,14]

Data were analyzed using SPSS version 22.0. Results were expressed as mean with standard deviation. Charts were used where necessary. Correlation was done using Pearson's correlation. *P*-values less than 0.05 were statistically significant.

Which year.- This should be the second paragraph.

What was your *P*-value.

Results

The mean age of patients was 63.53 ± 9.84.

Thirty patients acquired only primary education, 14 patients were educated up to secondary school, while 28 and 4 patients had university and postgraduate education, respectively.

Using the IPSS to assess symptoms severity, 16 patients had mild symptoms, 36 patients had moderate symptoms, while 24 patients had severe symptoms. The means QoL score was 4.42 ± 1.83

Fifty-eight patients had obstructed peak flow rate (Qmax) on uroflowmetry, 14 patients had equivocal Qmax, while 4 patients had normal Qmax.

Statistically significant, negative medium correlations were observed between Qmax and total IPSS [Table 1 and Figure 1], Qmax and the IPSS voiding and storage subscores [Tables 2,3 and Figures 2,3], as well as Qmax and disease-specific QoL score [Table 4 and Figure 4].

The Pearson correlation coefficient (*r*) for the correlation between Qmax and total IPSS was -0.520. *P*-value is 0.001

Discussion

This is a prospective study of the correlation between the peak urine flow rate on uroflowmetry (Qmax.) and physician-administered international prostate symptom score in patients presenting for the first time to the urology clinic of the university of Nigeria Teaching Hospital. The relationship between Qmax and the

Table 1: Correlation between Qmax and IPSS total

Variables	Pearson correlation	QMAX	IPSS Total
QMAX	Pearson Correlation	1	-.520**
	Sig. (2-tailed)		.001
	n	76	76
IPSS Total	Pearson Correlation	-.520**	1
	Sig. (2-tailed)	.001	
	n	76	76

**Correlation is significant at the 0.01 level (2-tailed)

Table 2: Correlation between Qmax and voidind subscore

Variables	Pearson correlation	QMAX	Voiding Sub
QMAX	Pearson Correlation	1	-.492**
	Sig. (2-tailed)		.001
	n	76	76
Voiding Sub	Pearson Correlation	-.492**	1
	Sig. (2-tailed)	.001	
	n	76	76

**Correlation is significant at 0.01 level (2 tailed). R value is -0.492; pvalue is <0.001

Table 3: Correlation between Qmaxand storage subscore

Variables	Pearson correlation	QMAX	Storage Sub
QMAX	Pearson Correlation	1	-.366**
	Sig. (2-tailed)		.001
	n	76	76
Storage Sub	Pearson Correlation	-.366**	1
	Sig. (2-tailed)	.001	
	n	76	76

**Correlation is significant at 0.01 level (2 tailed)

Table 4: Correlation between QOL and Qmax

Variables	Pearson correlation	QOL	QMAX
QOL	Pearson Correlation	1	-.328**
	Sig. (2-tailed)		.004
	n	76	76
QMAX	Pearson Correlation	-.328**	1
	Sig. (2-tailed)	.004	
	n	76	76

**Correlation is significant at 0.01 level (2 tailed); r value of -0.0328 and statistically significant p value of 0.004

voiding subscore, storage subscore, and the global impact of disease on QoL, respectively, were also evaluated.

The mean age of the patients in this study was 63.53 ± 9.84 which reflects the fact that symptomatic BPE is a disease of middle age and elderly men.

More than half of the studied patients did not acquire tertiary education. This also reflects the pervasive low level of education in the country.[15] Consequently,

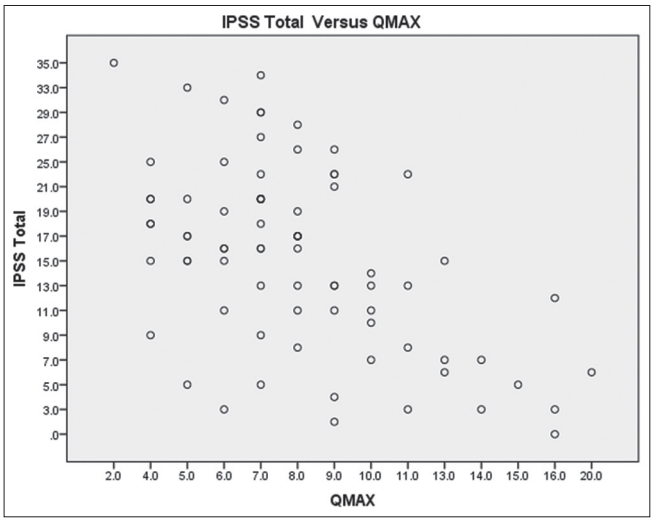

Figure 1: Scatter plot of IPSS total versus Qmax

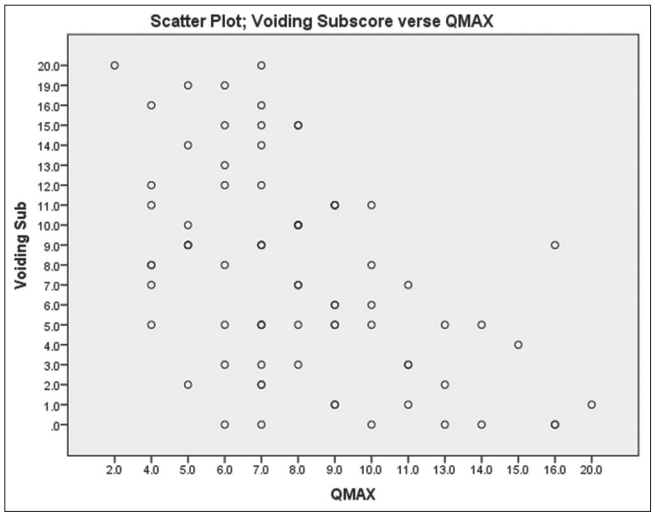

Figure 2: Scatter plot; voiding subscore vs Qmax

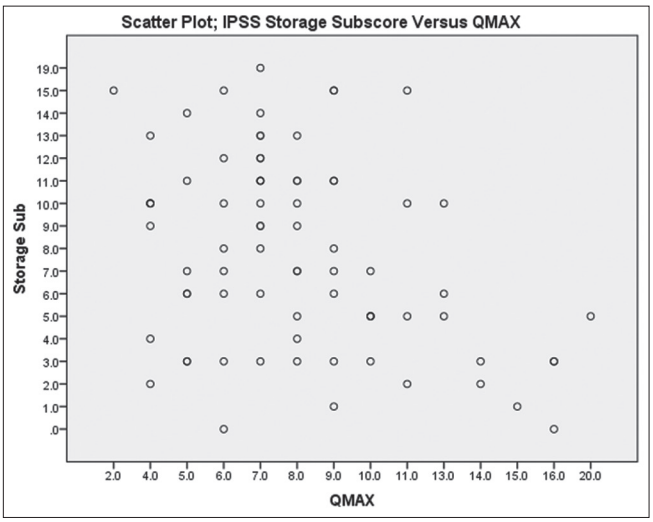

Figure 3: Scatter plot: IPSS storage subscore versus Qmax

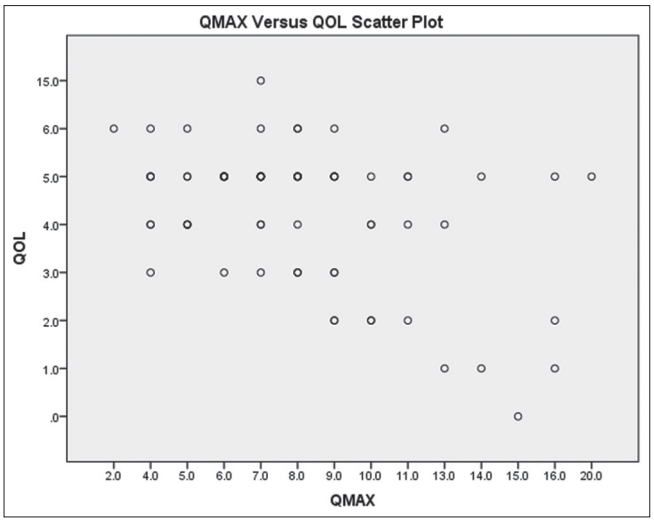

Figure 4: Qmax versus QoL scatter plot

IPSS questionnaire has to be completed for most of our patients in routine clinical practice.

Using the IPSS to categorize patients' symptom severity, approximately half of the patients have moderate symptoms (47%; n = 36). Bock-Oruma *et al.*,[16] Amu *et al.,*[17] and Oranusi *et al.*[18] also found a preponderance of moderate symptoms among their patients. Bosch *et al.*[19] however noted mild symptoms in 70% of patients in their study in the Netherlands. This observed pattern of presentation in our environment may be due to late presentation to hospitals.

76% of the patients (n = 58) have peak flow rate in the obstructed domain. This may reflect the severity of the disease in the population studied. There is a negative medium correlation between Qmax and total IPSS (r = -0.520) with a statistically significant P-value (0.001). Similar results were observed by many authors in studies where IPSS was self-administered.[12,18]

Some researchers, however, found weak correlation between the IPSS and peak urine flow rate.[20] There was also a negative medium correlation between Qmax and IPSS voiding subscores (questions 1, 3, 5, and 6) with an r value of -0.492, between Qmax and IPSS storage subscore (questions 2, 4, 7) with an r value of -0.366, and between Qmax and QoL score with an r value of -0.328. Similar inverse relationships were observed by Sountoulides[21] in his studies. Thus, the peak urine flow rate of BPE patients with LUTS will decrease irrespective of predominantly storage or voiding symptoms.

Furthermore, the disease-specific impact of BPE on QoL correlates negatively with the Qmax.

Conclusion

There is a statistically significant, negative medium correlation between physician-administered IPSS and Qmax. This correlation is similar to what obtains in studies where IPSS is self-administered.

Similar correlations were seen between Qmax and IPSS subscores and between Qmax and QoL score

Sim.(You did not study or compare the time it takes to assess flow rate versus IPSS so you cannot come to this conclusion)

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Conflicts of interest

There are no conflicts of interest.

References

1. Cruz F, Desgrandchamps F. New concept and pathophysiology of lower urinary tract symptoms in men. Eur Urol Suppl 2010;9:472–6.
2. McNeal JE. Normal histology of the prostate. Am J Surg Pathol 1988;12:619–33.
3. Berry SJ, Coffey DS, Walsh PC, Ewing LL. The development of human benign prostatic hyperplasia with age. J Urol 1984;132:474–9.
4. Ezeanyika L, Ejike C, Obidoa O, Elom S. Prostate disorders in an apparently normal Nigerian population 1: Prevalence. Biokemistri 2006;18:127-32.
5. Dmochowski RR. Bladder outlet obstruction: Etiology and evaluation. Rev Urol 2005;7(Suppl 6):S3–13.
6. Oelke M, Bachmann A, Descazeaud A, Emberton M, Gravas S, Michel MC, *et al*. EAU guidelines on the treatment and follow-up of non-neurogenic male lower urinary tract symptoms including benign prostatic obstruction. Eur Urol 2013;64:118–40.
7. Barry MJ, Fowler FJ, O'Leary MP, Bruskewitz RC, Holtgrewe HL, Mebust WK, *et al*. The American Urological Association symptom index for benign prostatic hyperplasia. The Measurement Committee of the American Urological Association. J Urol 1992;148:1549–64.
8. Jindal T, Sinha RK, Mukherjee S, Mandal SN, Karmakar D. Misinterpretation of the international prostate symptom score questionnaire by Indian patients. Indian J Urol 2014;30:252–5.
9. Öztürk MI, Koca O, Keleş MO, Güneş M, Kaya C, Karaman MI. International prostate symptom score: Really Appreciated by all patients or not? Urol J 2011;8:227–30.
10. Ogwuche EI, Dakum NK, Amu CO, Dung ED, Udeh E, Ramyil VM, *et al*. Problems of administration of the international prostate symptom score in a developing economy. Ann Afr Med 2013;3:171–3.
11. Schfer W, Abrams P, Liao L, Mattiasson A, Pesce F, Spangberg A, *et al*. Good urodynamic practices: Uroflowmetry, filling cystometry, and pressure-flow studies. Neurourol Urodyn 2002;21:261-74.
12. Garg R, Singla S, Garg R, Singla A, Sharma S, Singh J, *et al*. Experience with uroflowmetry in evaluation of lower urinary tract symptoms in patients with benign prostatic hyperplasia. J Clin Diagnostic Res 2014;8:1–3.
13. Haylen BT, Ashby D, Sutherst JR, Frazer MI, West CR.

Maximum and average urine flow rates in normal male and female populations-The Liverposl Nomograms. British journal of urology 1989;64:30-38.

14. Reynard JM, Yang Q, Donovan JL, Peters TJ, Schafer W, De La Rosette JJMCH, *et al*. The ICS-'BPH' Study: Uroflowmetry, lower urinary tract symptoms and bladder outlet obstruction. Br J Urol 1998;82:619–23.
15. National bureau of statistics. The National Literacy survey June 2010; media and marketing communications company group National commission for mass literacy, adult and non-formal education.
16. Bock-Oruma AAA, Dienye POP, Oghu ISI. Prevalence of lower urinary tract symptoms suggestive of benign prostatic hyperplasia in primary care, Port Harcourt, Nigeria. South African Fam Pract 2013;55:467–72.
17. Amu OC, Udeh EI, Ugochukwu AI, Dakum NK, Ramyil VM. The value of international prostate symptom scoring system in the management of bph in jos, Nigeria. Niger J Clin Pract 2013;16:273–8.
18. Oranusi CK, Nwofor AE, Mbonu O. Correlation between international prostate symptom score and uroflowmetry in patients with benign prostatic hyperplasia. Niger J Clin Pract 2017;20:454–8.
19. Bosch JL, Hop WC, Kirkels WJ, Schröder FH. The International Prostate Symptom Score in a community-based sample of men between 55 and 74 years of age: Prevalence and correlation of symptoms with age, prostate volume, flow rate and residual urine volume. Br J Urol 1995;75:622–30.
20. Ojewola RW, Oridota ES, Balogun OS, Alabi TO, Ajayi AI, Olajide TA, *et al*. Prevalence of clinical benign prostatic hyperplasia amongst community-dwelling men in a South-Western Nigerian rural setting: A cross-sectional study. Afr J Urol 2017;23:109–15.
21. Sountoulides P, van Dijk MM, Wijkstra H, de la Rosette JJMCH, Michel MC. Role of voiding and storage symptoms for the quality of life before and after treatment in men with voiding dysfunction. World J Urol 2010;28:3–8.