Relationship between Lower Urinary Tract Symptoms measured by International Prostate Symptom Score and Prostate Volume

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ABSTRACT

Introduction: Incidence and progression rate of lower urinary tract symptoms rises steeply with age; the most significant cause is believed to be Benign Prostatic Hypertrophy. Subjective assessment with International Prostate Symptom Score/Quality of Life and objective measurement with Ultrasonography can be used for assessing the severity of lower urinary tract symptoms.

Materials and Methods: This was an observational study done at National Academy of Health Sciences, Bir Hospital from October 2020 to February 2021 which included ninety men above the age of 50 years presenting with lower urinary tract symptoms in Urology Unit. The initial evaluation was done with history taking, digital rectal evaluation to exclude tumor and brief neurological examination followed by scoring with International Prostate Symptom Score and International Prostate Symptom Score/Quality of Life score. The patients were advised for Transabdominal Ultrasonography to look for prostate volume and residual volume of urine.

Results: In this study 82.22 % of patients had International Prostate Symptom Score of more than 19 and 47.8 % of patients had quality of life score of 5 suggesting that most had severe symptoms. Prostate volume showed mild correlation with International Prostate Symptom Score (r=0.166) and with age group (r=0.088).

Conclusion: In the present study, prostate volume and lower urinary tract symptoms severity showed mild correlation suggesting that larger prostate volumes do not necessarily mean more severe symptoms. Hence International Prostate Symptom Score can be a better tool for assessing patients with lower urinary tract symptoms due to Benign Prostatic Hypertrophy and planning further treatment.

Keywords: benign prostatic hypertrophy, international prostate symptom score, lower urinary tract symptoms, quality of life.

INTRODUCTION

Lower urinary tract symptoms (LUTS) include storage as well as voiding disturbances. Although Benign Prostatic Hypertrophy (BPH) is a common cause of these symptoms, some men with LUTS have no prostate enlargement.[1] About 50% of the men aged 51-60 years and 90% of men over aged 80 years have histological evidence of BPH.[2] Pathologic study at autopsy in Asian and Caucasian men showed the overall prevalence of BPH was 74.8% in men with mean age of 64.4 years (range

22–89 years).[3]

Clinical diagnosis of BPH is done by severity assessment of LUTS, prostate volume and urinary flow rate. International Prostate Symptom Score (IPSS) is a subjective indicator of severity of LUTS. IPSS is based on the answers to seven question relating to urinary symptoms: incomplete emptying, frequency, intermittency, urgency, weak stream, straining and nocturia which are assigned points from 0 to 5 with total score ranging from 0 to 35.[4] These symptoms are categorized as Mild (=<7), Moderate (8 -19) and Severe (20 -35). IPSS is recommended as the symptom scoring tool to be used for the baseline assessment of symptom severity in men with LUTS.[5] The objective parameters used for assessment of BPH are prostate volume, prostate specific antigen (PSA), uroflowmetry and residual urine volume. Ultrasound of prostate gland is a noninvasive, rapid and inexpensive test used to measure the prostate volume.

This study aimed to evaluate IPSS as a tool to differentiate severe cases requiring intervention and predict the degree of the severity depending on the subjective symptoms. It will help in correlating the subjective and objective symptoms and address the controversy on relationship between IPSS and prostate volume seen in literature. The purpose of this study is to analyze and establish the relation between IPSS and prostate volume.

MATERIALS AND METHODS

This study was an observational study conducted at National Academy of Health Sciences (NAMS) , Bir Hospital after approval from the Institutional Review Board from October 2020 to February 2021. All the patients were counseled regarding the purpose of the study and the methods used. Male patients aged 50 yrs and above attending the surgical or urological department with LUTS were included in the study except those with prostatitis or chronic cystitis, suspected or diagnosed cases of prostate cancer, patients with neurogenic bladder and those who did not give consent. Minimum sample size for this study was calculated to be 90 taking reference from previous study using $n = z^2 \times p \times (1-p)/ d^2$.

The patients with features of LUTS were taken into the study as per the inclusion criteria and evaluated on the basis of history, symptom scoring and then with digital rectal examination for prostate. The patients were subjected to IPSS tool on basis of which the patients were divided into 3 categories: Mild: 0-7, Moderate: 8-19 and Severe: 20-35. Prostate volume and post-void residual urine (PVRU) was calculated using Trans-abdominal Ultrasonography(TAUS). Age, prostate volume and PVRU were compared according to IPSS groups. SPSS 26 was used for statistical analysis. Pearson's Correlation coefficient was used to assess association between continuous variables and the one way ANOVA was used to measure association between ordinal variables.

RESULTS

The patients were the age of 51 to 87 years with mean age of 70 years ± 8.57 years. While evaluating the IPSS score, 3 patients had Mild score, 13 patients had Moderate score and 74 patients had severe score with 82.22 % patient having IPSS score > 19.

Table 1. Severity grades with age groups

Age (yrs)	IPSS				P VALUE
	MILD	MODERATE	SEVERE	TOTAL	
50-60 yrs	3	1	9	13	0.898
60-70 yrs	0	6	30	36	
70-80 yrs	0	6	27	33	
>80 yrs	0	0	8	8	

Table 2. Correlation of Prostate Volume with International Prostate Symptom Score

		Age years	IPSS score
Prostate Volume	Pearson Correlation	0.088	0.166
	P – value	0.064	<0.001

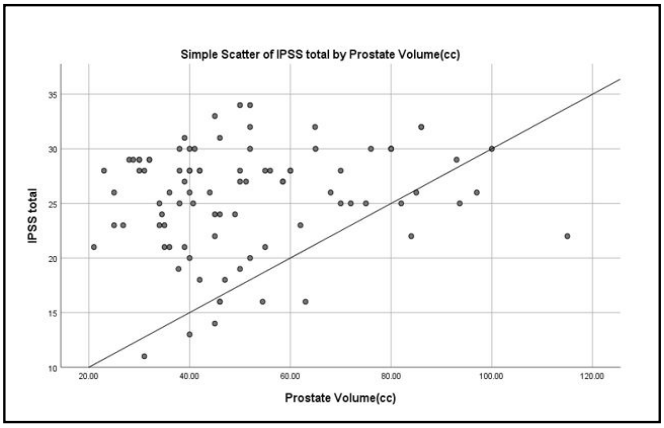

Figure 1. Correlation of International Prostate Symptom Score with prostate volume

DISCUSSION

LUTS related to BPH is a common condition of the aging males that forces them to seek medical attention for the bothersome symptoms. LUTS includes urinary frequency, urgency, weak stream, and nocturia and is the most common problem in BPH patients.[5]

In the present study, we evaluated retrospectively the relationship between LUTS and non-invasive objective parameters using the IPSS – QoL tool and TAUS for prostate size. In the present study out of 90 BPH patients 3 (3.33%) had mild, 13 (14.44%) had moderate and 74 patients (82.22%) had severe symptoms (IPSS score).

In a similar study conducted by Thapa N et al in 2017 at Eastern Nepal, the mean age of the patients was 65.2 years.[6] Most of the patients (47.5%) were in the age group of 60-69 years. Out of 100 patients, 75 had moderate symptoms while 25 had severe symptoms. [6] The prostatic size in patients with moderate symptoms was 34.65 cm^3, and that in patients with severe symptoms, it was 55.85 cm^3. The overall correlation coefficient of IPSS with prostatic size was found to be 0.533, a moderate positive correlation. However, the p-value in the study was found to be >0.05, which was not significant. In their study, the overall correlation coefficient of IPSS with prostatic size was found to be 0.24. Hence, there was no correlation found between IPSS and prostatic size.[6]

Mostafa et al. showed 58.3% of BPH patients had mild, 27.3% had moderate and 4.4% had severe symptoms on the basis of IPSS and the prevalence of moderate to severe was 31.7%.[7] Mean prostatic volume in BPH patients was found to be 42.9 ±18.4 cm^3 with a range of 20-92 cm^3, which was comparable to other studies done by Agarwal et al., where the mean volume of prostate was found to be 42.5 ± 12.7 cm.[8] Akin et al. reported a mean prostate volume of 35.77 ± 3.86 cm^3 in 48 patients of BPH.[7] In the study conducted by Dicuio et al. mean prostate volume was 41.4 cm^3.[9]

There was a positive correlation between prostate volume and total IPSS score in our study, which was statistically significant. (r =0.45, t =3.8, p). Age of the patient did not have statistically significant correlation in this study with correlation coefficient r=0.203. In this study the mean prostate volume was found to be 51.25 cm^3 with range of 21 – 115. The larger size of the gland in this study may be due to late presentation of the patients who tend to ignore minor symptoms.

Barry et al reported no correlation between symptom severity and prostate size or PVRU and El Din et al found only a weak correlation among these parameters.[4,10] The overall correlation coefficient of Prostate volume with IPSS score was found to be 0.166, a mild positive correlation. Similar to the study by Thapa N et al in 2017, the p value in this study was also 0.531 (>0.05) which was not significant.[6] This data shows that there is no correlation between IPSS and prostatic size.

When patients included in this study were asked the questions related to Quality of life (QoL) score regarding urinary symptoms, 43 patients had QoL of 5(Unhappy) out of which 41 patients had Severe IPSS score. Most patients with Severe IPSS score had poorer QoL ranging from 4-6. These findings are consistent with the widely recognized fact that people vary in the way they are affected by any health problem which may be affected by the person's physical, social and psychological environment. This has previously been demonstrated in the UK in a comparison of men with BPH being treated in the public sector with those treated in private health institute.[11] The interaction of these factors underlines the point that not only clinical findings but also those relating to the individual's expectations and environment must be and often is, taken into account in the decision to offer surgery or any therapeutic measures.

There were, however, limitations in the study. The study was retrospective in nature and although the radiologist were blinded to the IPSS and LUTS severity, TAUS were done by different radiologists which makes it a subjective assessment and operator dependent. Various objective parameters such as DWT, PVR, Qmax, and Qave could not be included in the study.

CONCLUSION

From the data collected from the present study, it can be concluded that there is only a mild positive correlation between IPSS score and Prostate volume obtained via Transabdominal Ultrasound. IPSS – QoL score is feasible and easy to perform diagnostic tool especially in the context of resource limited settings. A symptom inventory (e.g., International Prostate Symptom Score [IPSS] or AUA (American Urological Association) Symptom Index [AUA-

SI]) is recommended for an objective assessment of symptoms at initial contact and for evaluation of response to treatment.[12,13,14] IPSS is a promising tool to assess patients with LUTS and also to determine which patients require treatment.

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