

CORRELATION OF INTERNATIONAL PROSTATE SYMPTOM SCORE WITH PROSTATE VOLUME AND INTRAVESICAL PROTRUSION OF PROSTATE

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Abstract:

Objective: To determine the correlation of international prostate symptom score with prostate volume and Intravesical protrusion of prostate.

Methods: This cross-sectional study was performed on 60 elderly patients presented with LUTS suggestive of Benign Enlargement of Prostate. Their evaluation included DRE, IPSS, Uroflowmetry (Qmax), serum PSA measurements and transabdominal ultrasound scan. Statistical analysis was performed by SPSS version 13 using Chi square test and scatter plots together with Spearman's correlation coefficients were used to assess the relationship between IPP and PV with IPSS.

Results: Mean age of the patients was 66.7±9.85 years, IPSS 23.6±6.53, mean prostatic volume was 60.23±38.16 mL, Qmax 7.98±3.87, PVR was 163.18±141.73 mL. Fifty percent of patients had severe degree (>10mm) of intravesical protrusion of the prostate, 30% had moderate and 20% had mild IPP.

There was significant positive correlation between IPSS and PV ($r=0.585$, $P < 0.001$), IPSS and IPP ($r=0.698$, $P < 0.001$).

Conclusion: From this cross-sectional study it is revealed that both the IPP and prostate volume had strong correlation with IPSS, but IPP had stronger correlation with IPSS.

Key words: International Prostate symptoms score, benign enlargement of prostate, peak urinary flow rate.

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Introduction:

Lower urinary tract symptoms and urinary voiding disturbances in patients with benign prostatic hyperplasia (BPH) are believed traditionally to be caused by infravesical obstruction due to nodular enlargement of the inner gland of the prostate. Men with a larger prostate (or higher PSA) are at significantly greater risk of LUTS, impaired quality of life, and complication such as acute urinary retention¹. Accordingly, it is likely that the evaluation of infravesical obstruction contributes considerably not only to the assessment of the severity of the disease but also to the selection of treatment option.

Several symptoms indices were formulated by different study group of different countries used for assessment of BPH symptoms to evaluate the degree of bladder outlet obstruction. In 1992 the American Urological Association (AUA) symptoms score was published and it has been endorsed by the World Health Organization as the international prostate symptoms score (IPSS).

Currently, evaluation and selection criteria for treatment of benign prostatic enlargement include the international prostate symptom score (IPSS), uroflowmetry and postvoid residual urine (PVR) or urodynamic study (AUA practice guideline committee, 2003)² and presence or absence of complications such as, haematuria, recurrent urinary tract infection, upper tract changes or renal insufficiency are also considered. Urodynamic study in the international gold standard in the diagnosis of BOO³.

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The most extensively investigated and routinely available clinical indices for BOO are prostate volume (PV) and serum Prostate Specific Antigen (PSA)⁴. Anatomical configuration was in the form of Intravesical prostatic protrusion (IPP) and could affect voiding⁵. IPP is caused by the enlarging median lobe. It has been postulated that it is the grade of the IPP that determines the degree of bladder outlet obstruction more than the prostate volume⁶.

Although the prostate volume and its configuration are inherent features of the prostate of the gland, relationship has yet to be defined by any study. In this study we aimed to define relationship of prostate volume and IPP with International Prostate Symptom Score (IPSS).

Study Methods:

The present study is a cross sectional study carried out in the Department of Urology, Shaheed Suhrawardy Medical College Hospital, Dhaka from January 2012 to December 2012. The study population of this study was patients of BPH with lower urinary tract symptoms attended in the out patient department of Urology.

The initial evaluation of the patients consisted of history taking physical examination and some relevant investigations. Patients with a know history of lower urinary tract surgery, prostate cancer and bladder carcinoma were excluded. The physical examination including DRE was done to exclude tumor and neurological examination was done to exclude any neurological deficit and neurologically related bladder dysfunction.

The bladder was next assessed by transabdominal ultrasonography. Prostatic volume (PV) was measured and patients are divided into three groups depending on the prostatic volume measured in milliliter (mL). Patients with prostatic volume between 25-50 mL in group-I, <50-75mL in group-II and <75 mL in group-III. IPP was measured in mm and bladder capacity had to have 150mL or more. Patients were divided into three groups according to the severity of the protrusion. Intravesical protrusion 0->5mm considered mild, 5-10mm moderate and >10mm considered severe. Uroflowmetry and PSA was also measured.

Statistical analysis was performed by SPSS version 13 using Chi square test and scatter plots together with Spearman's correlation coefficients were used to assess the relationship between IPP and PV with IPSS.

Results:

The mean age of the patients was 66.7±9.85 years (range 48 to 85 years). The mean IPSS was 23.6±6.53 (range 11-35). The mean prostatic volume (PV) was 60.23±38.16 (range 32-220mL) and Intravesical protrusion of prostate (IPP) was 13.43±10.05 mm (range 3mm-40mm).

Table-I
Distribution of patients by IPSS (n=60)

IPSS	Frequency	Percent
Mild (0-7)	00.00	00.00
Moderate (8-19)	18	30.00
Severe (20-35)	42	70.00
Total	60	100.00

IPSS was obtained with the help of IPSS questionnaire during initial evaluation. Moderate symptoms were in 30% patients and severe symptoms were in 70% cases.

Table-II
Distribution of patients by PV (n=60)

Group	PV (mL)	Frequency	Percent
Group-I	25-<50	34	56.67
Group-II	50-75	12	20.00
Group-III	>75	14	23.33
Total	60	100.00	

This table shows that PV was between 25-<50mL was in 56.67% cases and between 50-75 was in 20% cases and in 23.33% cases PV was >75mL.

Table-III
Distribution of patients by IPP (n=60)

IPP grade (mm)	Frequency	Percent
Mild (<5)	12	20.00
Moderate (5-10)	18	30.00
Severe (>10)	30	50.00
Total	60	100.00

This table shows that 50% patients had severe (>10mm) IPP.

Table IV
Distribution of IPSS by prostate volume (PV) (n=60)

Grading of IPSS	Grading according to PV (mL)			Total
	Group-I 25-<50	Group-II 50-<75	Group-III >75	
Moderate (8-19)	12 (35.3)	4 (33.33)	2 (14.3)	18 (30.00)
Severe (20-35)	22 (64.7)	8 (66.67)	12 (85.7)	42 (70.00)
Total	34 (100.00)	12 (100.00)	14 (100.00)	60 (100.00)

Chi square value=7.01, df=2, p value <0.05

From this table it is found that in group-I and group-II had also severe grade of IPSS in 64.7% and 66.67% cases respectively. Patients in group-III (PV<75mL) had severe grade of IPSS in 85.7% cases.

Table V
Distribution of IPSS by IPP (n=60)

Grading of IPSS	Grading of IPP			Total
	Mild	Moderate	Severe	
Moderate (8-19)	12 (100.00)	4 (22.22)	2 (6.67)	18 (30.00)
Severe (20-35)	0(00.00)	14 (77.78)	28 (93.33)	42 (70.00)
Total	12 (100.00)	18 (100.00)	30 (100.00)	60 (100.00)

Chi square value=28.28, df=2, p value =0.001

This table shows that IPP has significant association with IPSS as 93.33% patients with severe IPP had severe symptoms.

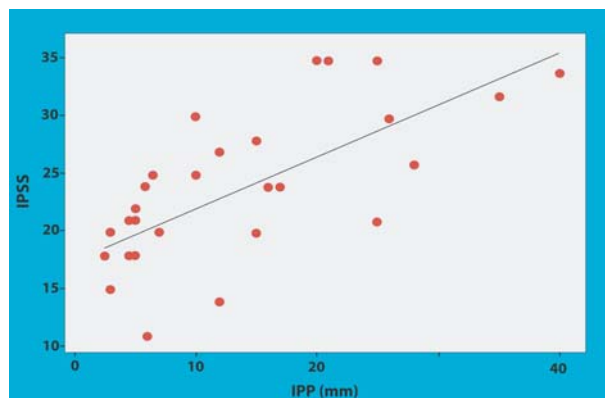


Fig.-1: Correlation of IPSS with PV (mL)

Pearson correlation =0.585, P value<0.001

The Karl Pearson correlation test showed r = 0.585, p < 0.001, which signifies positive correlation between the IPSS and PV.

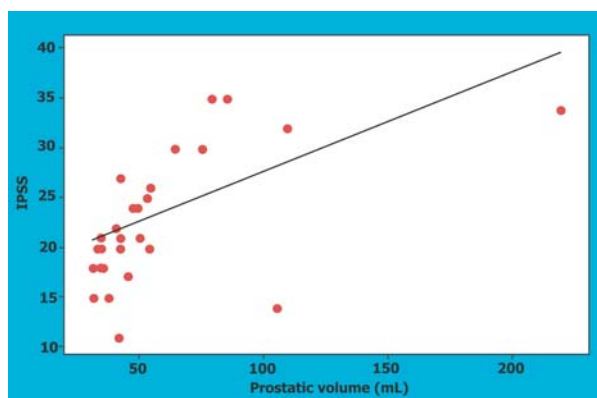


Fig.-2: Correlation of IPSS with IPP (mm)

Pearson correlation =0.689, P value<0.001

The Karl Pearson correlation test showed r = 0.698, p < 0.001, which signifies high degree of positive correlation between the IPSS and IPP.

Discussion:

Benign prostatic enlargement is a common cause of BOO in men older than 50 years who present with LUTS. The

features of the gland such as defined by prostatic volume and configuration (as defined by IPP) are considered to further define the contribution of anatomic components to diagnosis of BOO. IPSS is a simple tool in the evaluation of BOO due to Benign prostatic enlargement and worsening score may warrant intervention.

In the present study it was found that mean age was 66.7 ± 9.85 years, mean IPSS was 23.6 ± 6.53 , mean PV was 60.23 ± 38.16 mL and mean IPP was 13.43 ± 10.05 mm. Twenty two patients (64.70%) with PV less than 50 mL presented with severe grade of IPSS, 66.67% patients with PV between $50 < 75$ mL had severe IPSS. Twelve patients (85.7%) had PV above 75 mL presented with severe IPSS.

Chia et al. determined the effects of PV and IPP on lower urinary tract function in patients presented with LUTS and correlated the results with pressure flow study. The mean age of the patients was 64.6 years and IPSS was 20.3. These results are consistent with results of the present study.

Bantis et al⁷ found statistical correlation between IPSS and BOO with PSA ($p = .004$) and PV ($p < .001$). In their study there is also correlation with PV and IPSS ($r = 0.585$, $p < .001$). Girman et al⁸ also found somewhat stronger relationship of prostate volume with symptoms as in their study. So this results of the presents study are similar with these studies.

In the present study mean IPP was found 13.43 ± 10.05 mm (range 3mm -40mm). Twenty percent patient had mild (< 5 mm) IPP, 30% had moderate (5-10mm) IPP and 50% patients had severe (> 10 mm) IPP. Patients with IPP > 10 mm had severe IPSS in 93.33% cases and IPP between 5-10mm had moderate IPSS in 77.78% cases. Pear Son correlation test between IPSS with PV (mL) showed $r = 0.585$, p value < 0.001 and correlation between IPP and IPSS showed $r = .698$, $P < .001$.

Wadie et al⁹ had determined negative correlation with PV and Qmax as well as significant correlation of IPSS with PV. Rosier et al reached a similar conclusion when they observed a correlation of obstruction grade with symptom score.

Lim et al also found good correlations between IPP, PS and PV when their indices were correlated with BOOI scotter plot, the correlation coefficient ranged from $p = 0.314$ to $p = 0.5007$. Among then IPP had better correlation with BOOI. These results are more or less similar with the results of the present study.

Conclusion:

From this cross-sectional study it is revealed that both the IPP and prostate volume had strong correlation with IPSS. But IPP had stronger correlation with IPSS than PV.

Conflict of Interest : None Declared

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Abbreviations:

BPH: Benign Prostatic Hyperplasia
 IPSS: International Prostate Symptoms Score
 Q_{max}: Peak Urinary flow rate
 PVR: Post voidal residual Urine