

THE RELATIONSHIP BETWEEN THE DEGREE OF INTRAVESICAL PROSTATIC PROTRUSION AND CLINICAL PROGRESSION IN PATIENTS WITH BENIGN PROSTATIC ENLARGEMENT

Hypothesis / aims of study

We prospectively evaluated the use of noninvasive transabdominal ultrasound to study the relationship between the intravesical prostatic protrusion (IPP) and clinical progression in patients with benign prostatic enlargement (BPE).

Study design, materials and methods

Men ≥ 50 years presenting with lower urinary tract symptoms (LUTS) secondary to BPE were included in the study. International Prostate Symptom Score (IPSS), peak flow rate (Q-max), post-void residual urine (PVR) and serum prostate specific antigen (PSA) were measured. All patients underwent transabdominal ultrasound measurement of prostate size and the degree of IPP in the mid sagittal section. We divided patients into two groups based on the degree of IPP: group 1 (>10 mm) and group 2 (≤ 10 mm) (table 1). Patients were stratified to different treatment options including watchful waiting, alpha blockers with or without 5-alpha reductase inhibitors. Those who developed symptom progression in the IPSS score, high post-void residual urine volume (>100 mL), acute urinary retention were considered to have disease progression. The odds ratio for clinical progression in group 1 and group 2 were calculated.

Table 1: Comparing clinical data between groups

	All patients	Group 1	Group 2	Statistics
Number of patients	84	37	47	
Age (mean $\pm$ SD)	63.52 $\pm$ 6.29	64.53 $\pm$ 6.52	62.79 $\pm$ 6.09	t=1.23
IPP (mean $\pm$ SD)	12.64 $\pm$ 6.75	18.40 $\pm$ 5.14	7.87 $\pm$ 1.58	t= 13.5*
Total IPSS [†] (mean $\pm$ SD)	17.40 $\pm$ 3.39	19.23 $\pm$ 2.52	16.32 $\pm$ 3.39	U'=828*
Bother score [†] (mean $\pm$ SD)	3.03 $\pm$ 0.80	3.31 $\pm$ 0.68	2.86 $\pm$ 0.82	U'=719*
Irritative symptoms [†] (mean $\pm$ SD)	7.23 $\pm$ 2.11	7.88 $\pm$ 1.82	6.84 $\pm$ 2.20	U'=706*
Obstructive symptoms [†] (mean $\pm$ SD)	10.17 $\pm$ 2.30	11.35 $\pm$ 1.74	9.48 $\pm$ 2.33	U'=840*
Prostate Volume (mean $\pm$ SD)	50.11 $\pm$ 11.52	54.03 $\pm$ 10.14	45.00 $\pm$ 5.94	t= 5.48 *
Q _{max} [†] (mean $\pm$ SD)	12.80 $\pm$ 2.81	10.85 $\pm$ 2.49	13.95 $\pm$ 2.31	t= 5.27*

* Significant difference between the mean values in group 1 and 2.

† Statistical analysis was done for only patients without retention (26 in group 1 and 43 in group 2)

t Student t-test

U' Mann-Whitney U-statistic

Results

A total of 84 patients were included in the study (37 in group 1 and 47 in group 2). A total of 14 patients (11 in group 1 and 3 in group 2) presented with acute urinary retention. Positive correlation was found between IPP and IPSS (figure 1) as well as prostate volume ($r = 0.43$ and 0.67 respectively) while negative correlation was found between IPP and Q-max, ($r = -0.47$). During an average follow-up period of 18 months (± 1.5), clinical progression was found in 70.6% in group 1 and 21.3% in group 2. The odds ratio for clinical progression for group 1 cohort was 8.8 (95% confidence interval [CI] 3.21–24.5) compared to group 2. Twenty percent of patients in group 1 versus 2% of patients in group 2 developed AUR during follow-up. Patients in group 1 were more than 6 times more likely to have prostate surgery compared to group 2.

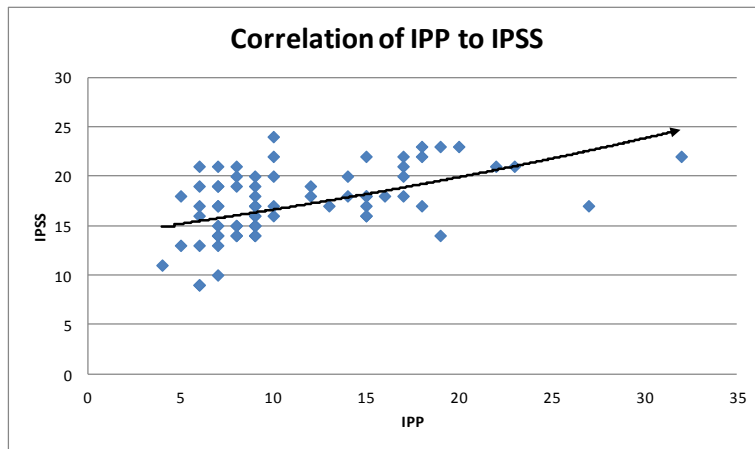


Figure 1: Correlation between IPP and total IPSS: Pearson correlation ($r = 0.48$), Coefficient of determination ($r^2 = 0.24$), 95% confidence interval 0.28-0.64 with p value < 0.05 .

Interpretation of results

Yuen et al¹ and Chia et al² have proposed the IPP grading system determined by transabdominal ultrasonography for measuring the degree of bladder outlet obstruction and found that IPP is an excellent predictor. Given the results of our study, we think that incorporation of IPP during clinical evaluation of BPE patients will add more refinement to the results. We agree with Lee et al³ in their suggestion that a symptomatic patient with a poor flow on uroflowmetry ($Q_{\max} < 10$ mL/s), increased PVR (of more than 100 mL) and Grade 3 IPP, would have significant bladder outlet obstruction and so, they would benefit from TURP or more aggressive medical therapy.

Concluding message

IPP is an important objective parameter for assessment of BPH patients. In addition, it may be used as a predictive factor for the clinical progression in such patients. A higher IPP results in more severe obstruction with higher incidence of increased PVR and urine retention. Patients with significant high IPP may benefit from more aggressive medical therapy or surgical intervention.

References

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3. Lee LS, Sim GH, Lim KB, Wang D, Foo KT: Intravesical prostatic protrusion predicts clinical progression of benign prostatic enlargement in patients receiving medical treatment. *Internat. J Urol* 17: 69–74, 2010

Disclosures

Funding: None **Clinical Trial:** Yes **Public Registry:** Yes **Registration Number:** (Approval Code: 413/05/09). **RCT:** No **Subjects:** HUMAN **Ethics Committee:** The study protocol was reviewed and approved by our institutional review board and by the Research Ethical Committee of Tanta University and the research proposal conformed to the accepted ethical standard **Helsinki:** Yes **Informed Consent:** Yes