

ENHANCED ACCURATE DIAGNOSTIC RATE OF BLADDER OUTLET OBSTRUCTION IN MEN WITH LOWER URINARY TRACT SYMPTOMS USING INTERNATIONAL PROSTATIC SYMPTOM SCORE VOIDING/STORAGE RATIO IN ASSOCIATION WITH TOTAL PROSTATIC VOLUME AND MAXIMUM FLOW RATE

Hypothesis / aims of study

Diagnosis of bladder outlet obstruction (BOO) in men with lower urinary tract symptoms (LUTS) is important but with difficulty by clinical symptoms, ultrasound of prostate, or uroflowmetry alone. The aim of this study was to investigate the predictive values of using International Prostate Symptom Score (IPSS) voiding to storage subscore (V/S) ratio in association with total prostate volume (TPV) and maximum flow rate (Qmax) in the accurate diagnosis of BOO in men with LUTS based on the videourodynamic study (VUDS) findings.

Study design, materials and methods

A total of 298 men with LUTS were enrolled. We analyzed the differences of the IPSS total (IPSS-T) and IPSS-V/S subscore ratio, TPV, Qmax between men with VUDS confirmed BOO and non-BOO and calculated the positive and negative predictive values (PPV and NPV) of BOO

Results

The patient numbers of VUDS verified BOO and non-BOO groups were 167 and 131 with the mean age 72.7 ± 9.0 years. The BOO group had a significantly higher IPSS-V/S ratio than non-BOO group (2.28 ± 2.25 v 0.90 ± 0.88 , $p < 0.001$). In the diagnosis of BOO, the combination of $TPV \geq 30\text{ml}$ and $Q_{\text{max}} \leq 10\text{ml/sec}$ rendered a 68.8% PPV and a 53.5% NPV (Table). With an additional criteria using $IPSS \geq 12$ or $IPSS \geq 15$, PPV were elevated to 75.0% and 78.5% with 50.9% and 50.2% in NPV. If we added an additional criteria of IPSS-V/S ratio > 1 or > 2 , PPV were elevated to 91.4% and 97.3% with 54.8% and 49.8% in NPV, 8.33 and 27.00 in +LR, and 0.65 and 0.79 in -LR, respectively. The combination of $TPV \geq 40\text{ml}$ and $Q_{\text{max}} \leq 10\text{ml/sec}$ rendered a 67.4% PPV and a 48.6% NPV in the diagnosis of BOO. With an additional criteria using $IPSS \geq 12$ or $IPSS \geq 15$, PPV were elevated to 75.0% and 76.7%. With an additional criteria using IPSS-V/S ratio > 1 or > 2 , PPV were elevated to 92.5% and 100% with 49.6% and 47.1% in NPV, 9.65 and 0.12 / 0 in +LR, and 0.80 and 0.88 in -LR, respectively (Table 1).

Interpretation of results

In the combination of the diagnostic criteria for BOO using IPSS, TPV and Qmax, the PPV and +LR were both elevated. IPSS-V/S ratio rendered a higher extra PPV and +LR than using IPSS-T. The data indicated that IPSS-V/S ratio was able to magnify the difference between these two groups and being a more useful diagnostic tool than IPSS-T in assessing male BOO in clinical trial or providing appropriate treatment.

Concluding message

The predictive rate of the accurate diagnosis of BOO in men with LUTS can be increased if we use IPSS-V/S ratio in association with TPV and Qmax. $IPSS-V/S > 1$ indicates a high probability of BOO. When we combine $IPSS-V/S > 1$ with a $TPV \geq 40\text{ml}$ and $Q_{\text{max}} \leq 10\text{ml/s}$, the accurate diagnostic rate of BOO can be greatly elevated.

Table 1. The predictive values of the combination of IPSS, TPV, and Qmax in the diagnosis of BOO in men with LUTS

	BOO	Non-BOO	Total	PPV	NPV	+LR	-LR
$TPV \geq 30\text{ml}$ & $Q_{\text{max}} \leq 10\text{ml/s}$	88	40	128	68.8%	53.5%	1.73	0.68
+ $IPSS-T \geq 12$	60	20	80	75.0%	50.9%	2.34	0.76
+ $IPSS-T \geq 15$	51	14	65	78.5%	50.2%	2.85	0.78
+ $IPSS\ V/S > 1$	64	6	70	91.4%	54.8%	8.33	0.65
+ $IPSS\ V/S > 2$	36	1	31	97.3%	49.8%	27.00	0.79
$TPV \geq 40\text{ml}$ & $Q_{\text{max}} \leq 10\text{ml/s}$	58	28	86	67.4%	48.6%	1.62	0.83

+ BOO: bladder outlet obstruction, IPSS-T: total IPSS score, IPSS-V/S: the ratio of IPSS-V and IPSS-S, PPV: positive predictive value, NPV: negative predictive value

+LR: positive likelihood ratio, -LR: negative likelihood ratio

Disclosures

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