

ANALYSIS OF PROGNOSTIC FACTORS IN PREOPERATIVE EVALUATION FOR SYMPTOMATIC BENIGN PROSTATIC HYPERPLASIA

Hypothesis / aims of study

To identify preoperative predictive variables regarding treatment outcomes following transurethral resection of the prostate (TURP) of patients with symptomatic benign prostatic hyperplasia (BPH).

Study design, materials and methods

A total of 1,397 men who had undergone TURP for lower urinary tract symptoms (LUTS) with BPH between January 1993 and December 2001 were retrospectively reviewed. All patients had undergone a preoperative evaluation in which their International Prostate Symptom Score (IPSS), quality-of-life (QOL) index, ultrasound estimated post-void residual urine volume and uroflowmetry data were determined. The urodynamics including a pressure-flow study was also performed in all patients before surgery. Patients were included in this analysis if they were judged to be not associated with any of the exclusion criteria listed in the Appendix, and if they had completed postoperative assessment at 12 months, thus resulting in 370 cases being enrolled into the final analysis. The efficacy of TURP was evaluated regarding the symptoms, QOL and peak urinary flow rate (Q_{max}) at 12 months after the operation. Two definitions of treatment success for each variable were arbitrarily established based on the estimation criteria suggested by Homma et al (Table 1).⁽¹⁾ Treatment was considered to be successful if each of the outcome variables was judged to demonstrate a "Fair or greater improvement" and a "Good or greater improvement". Preoperative variables including patient age, prostate volume, total IPSS, total storage symptoms (nocturia, urgency, increased frequency) and total voiding symptoms (straining, intermittency, slow stream), QOL index and urodynamic parameters were statistically investigated to elucidate those factors that can influence treatment efficacy. A multiple logistic regression analysis using the forward stepwise regression method was performed to select a set of variables. P value less than 0.05 was considered to indicate significance.

Results

The mean age was 70.0 years. Preoperative urodynamic abnormalities included BOO in 302 (81.6%), impaired detrusor contractility in 88 (23.8%) and detrusor overactivity (DO) in 151 (40.8%). The median value of maximum watts factor (W_{max}) was 8.4 (W/m²) in weak, 13.2 in normal and 19.4 in strong detrusors, respectively. The mean estimated prostate volume was 42.2 grams and actual weight of tissue resected was 23.2 grams. There was a significant improvement in each of the outcome variables at 12 months after TURP. Results of the multivariate analysis are summarized in Table 2. The presence of DO is invariable independent determinant to decrease IPSS improvement. A greater magnitude of maximum detrusor pressure (P_{det.max}) and a higher degree of baseline BOO (Schafer obstruction grade) are determinants to increase IPSS improvement. The presence of DO almost invariably resulted in deterioration in the improvement of QOL index, while the presence of a higher degree of baseline BOO (Schafer obstruction grade and Abram-Griffiths number: AG number) was related to increased improvement in the QOL index. It was suggested that the severity of baseline storage symptoms might deteriorate QOL improvement. As for Q_{max}, parameter quantifying detrusor contractility (W_{max}), as well as the degree of baseline BOO and a magnitude of detrusor pressure at Q_{max} (P_{detQmax}) are thought to be predictors of improvement. Age was selected as an invariable factor which was correlated with improvement in Q_{max}.

Interpretation of results

The presence of DO and a higher degree of BOO were both associated with postoperative improvement both in symptoms and the QOL. The initial level of symptoms (especially storage symptoms) seemed to be predictive of an improvement in the QOL, while the

baseline degree of detrusor contractility and degree of BOO seemed to influence the improvement in Qmax. Age was consistently predictive of Qmax improvement.

Concluding message

It is efficacious to take into consideration multiple preoperative factors, including age, symptom score, QOL index, and urodynamics, in particular those variables obtained by pressure-flow analysis, when selecting patients with LUTS associated with BPH who are most likely to benefit from TURP.

(1) Homma, Y., Kawabe, K., Tsukamoto, T., Yamaguchi, O., Okada, K., Aso, Y. et al: Estimate criteria for efficacy of treatment in benign prostatic hyperplasia. *Int J Urol*, 3: 267, 1996

Appendix: Exclusion criteria

Preoperative state

- Neurogenic bladder dysfunction (confirmed or suspected)
- Disease with BOO other than BPH (bladder neck and/or urethral stricture)
- History of prostatic and/or urethral surgery
- Diagnosed or suspected carcinoma of prostate
- Patients who received 5 α -reductase inhibitors
- Patients with urinary tract infection
- Known bladder neoplasm and/or stones
- Acute or chronic prostatitis

Postoperative state

- Patients with urinary incontinence that persisted more than 3 months
- Diagnosed or suspected BOO due to bladder neck and/or urethral stricture
- Patients who received 5 α -reductase inhibitors
- Patients with urinary tract infection
- Acute or chronic prostatitis

Table 1

Efficacy	IPSS	QOL index	Qmax
	post/pre	pre-post	post-pre
Excellent	≤ 0.25	≥ 4	≥ 10 ml/s
Good	≤ 0.50	3	≥ 5.0 ml/s
Fair	≤ 0.75	2, 1	≥ 2.5 ml/s
Poor/Worse	> 0.75	≤ 0	< 2.5 ml/s

Table 2

	Fair or greater			Good or greter		
	OR	(95% CI)	p	OR	(95% CI)	p
IPSS						
Detrusor overactivity	0.45	(0.22-0.93)	0.03	0.56	(0.33-0.94)	0.03
Pdet.max (cmH ₂ O)	9.70	(3.0-31.3)	< 0.001			
Obstruction grade				1.66	(1.29-2.12)	< 0.001
QOL index						
Total IPSS	0.87	(0.80-0.94)	< 0.001			
Total storage symptoms	0.94	(0.91-0.98)	0.01	0.88	(0.81-0.95)	0.001
QOL index	4.82	(2.70-8.61)	< 0.001	4.77	(3.24-7.02)	< 0.001
Detrusor overactivity	0.71	(0.31-0.94)	0.01	0.79	(0.43-0.97)	0.02
AG number				2.43	(1.54-3.82)	< 0.001
Obstruction grade	1.57	(1.04-2.37)	0.03			
Qmax						
Age (years)	0.92	(0.88-0.96)	< 0.001	0.94	(0.90-0.97)	< 0.001
Qmax (ml/sec)	0.21	(0.10-0.43)	< 0.001	0.40	(0.28-0.62)	< 0.001
Pdet.Qmax (cmH ₂ O)	4.31	(3.41-10.7)	< 0.001	7.41	(3.68-14.9)	< 0.001
AG number	2.88	(1.66-4.73)	< 0.001			
Obstruction grade	2.45	(1.22-4.60)	0.01	2.53	(1.25-4.68)	0.01
Wmax (W/m ²)	2.88	(1.31-5.02)	< 0.001			

(OR: Odds ratio, CI: Confidential interval)