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DETRUSOR CONTRACTILITY IN BENIGN PROSTATE HYPERTROPHY PATIENTS AS INVESTIGATED WITH 3 DIFFERENT ADVANCED URODYNAMIC METHODS

Aims

Many advanced urodynamic methods are used to assess bladder outlet obstruction (BOO)and detrusor contractility in men with benign prostate hypertrophy (BPH). The differential diagnosis between obstruction and hypocontractility in patients with impaired flowmetry has major diagnostic, prognostic and therapeutic implications. This study compared 3 urodynamic methods to see if they agree and to determine which best detects detrusor hypocontractility.

Methods

94 patients (mean age 65.8±6.9) with BPH were recruited to the study. Twenty had already undergone transurethral resection or incision of the prostate. Exclusion criteria were abdominal straining during the P/F study. All patients underwent a clinical examination, ultrasound scan and urodynamics with a P/F study according to ICS criteria. Data were analysed according to: a) Shäfer's Diagram; b) Wmax c) PUMA: detrusor efficiency (DE) (1,2,3).

Statistical analysis: the "K"-test was used to assess agreement between methods (see Table 1 for K-test reference values). Sensitivity and specificity of each method in detecting detrusor hypocontractility were determined on the basis of agreement between 2/3 methods.

Results

Depending on method detrusor hypocontractility is present in 25 to 46 patients (mean 38) with Wmax and PUMA providing similar results (46 and 43 patients respectively). Normal detrusor contractility was detected in 38 to 55 cases (mean 47) with Wmax classifying 48 patients as having normal contractility and being closest to the mean. PUMA and Shäfer's Diagram overlapped in classifying patients with hypercontractility (table 2). With the K test a moderately agreement emerged in patients with hypo and normal contractility and a very good agreement in those with hypercontractility (table 3). Table 4 reports sensitivity, specificity and overall diagnostic capacity expressed in percentages for each method.

Conclusions

The discrepancies in the assessment of detrusor contractility in men with BPH depend on the different hypotheses on which the methods are based (bladder shape), the equations used to define detrusor contractility and how the patients are classified: with 4 classes for PUMA and Shäfer's diagram, and 2 for Wmax. The difference between PUMA and Shäfer's diagram (which both have 4 classes) in classifying contractility lies in the fact that Shäfer's diagram calculates contractility from one point in the P/F study and takes Qmax and PdetQmax into consideration. PUMA calculates the DE value from the steady-state of the curve. If the point measured by Shäfer's diagram corresponds to a pressure or flow peak, detrusor contractility may be overestimated. This accounts for the relatively few hypocontractile and normocontractile patients on the Shäfer diagram compared with other methods.

PUMA emerged as having best overall diagnostic capacity for detrusor hypocontractility with a good balance between sensitivity and specificity.

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Tab. 1 “K” test reference values

K	Agreement
0.0-0.2	Poor
0.2-0.4	Sufficient
0.4-0.6	Moderate
0.6-0.8	Good
0.8-1.0	Excellent

Tab. 2 Results of advanced urodynamic methods

	DETRUSOR CONTRACTILITY			
	HYPO	NORMO	HYPER	TOTAL
PUMA	43	38	13	94
SHÄFER	25	55	14	94
Wm	46	48		94
MEAN	38	47	13,5	94

Tab. 3: Agreement between methods according to “K” test

	HYPOCONTRACTILITY		NORMOCONTRACTILITY		HYPERCONTRACTILITY
	PUMA	Wm	PUMA	Wm	PUMA
Wm	0,55		0,55		
SHÄFER	0,47	0,42	0,48	0.42	0,96

Tab. 4 Sensitivity, specificity and overall diagnostic capacity

	DETRUSOR CONTRACTILITY		
	PUMA	SHÄFER	Wm
SENSITIVITY	84,2	63,2	84,2
SPECIFICITY	91,1	98,2	85,7
OVERALL DIAGNOSTIC CAPACITY	88,3	84	85,1