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ADVANCED URODYNAMIC METHODS IN THE DIAGNOSIS OF BLADDER OUTLET OBSTRUCTION IN FEMALES

Aims

As there is no gold standard urodynamic criteria for diagnosing obstruction in women, we analysed data from pressure/flow (P/F) studies and compared five different methods and cut-off criteria in an attempt to assess bladder outlet obstruction (BOO) and detrusor contractility.

Methods

We studied 596 neurologically normal consecutive female patients, using our standard urogynaecological protocol which includes: case history, clinical uro-gynaecological and neurological examination, dynamic micturitional ultrasonography, urodynamic and/or videourodynamic tests (ICS criteria). Exclusion criteria were non-evaluable free flowmetry results as no comparison with the Blaivas cut-offs was possible and abdominal straining during P/F (pVes-pDetQmax ³ 10 cmH20)so only 173 patients (mean age 58.2±11) could be included in the study. BOO was diagnosed according to:

1. Romanzi's parameters (1999): BOO: maximum detrusor pressure at a maximum flow (PdetQmax) > 25 cm H20 with Qmax less than 15 ml/sec. Impaired detrusor contractility: maximum detrusor pressure (pDetmax) less than 15 cm H20 with Qmax less than 15 ml/sec.

2. Chassagne (1998): BOO: PdetQmax ³ 20 cmH20 with Qmax£ 15 ml/sec

3. PUMA criteria(1): PUMA uses urethral efficiency (UE), based on Pves and Qura during a P/F study, to assess BOO: UE³90 is indicative of no obstruction; 50≤UE<90 indicates slight obstruction and UE<50 severe obstruction. PUMA quantifies detrusor contractility in terms of Detrusor Efficiency (DE), based on Pdet and Qura during a P/F study; these data are not included in this study.

4. Blaivas (2000)(2): BOO: P/F data were analysed on the basis of the BOO nomogram which classifies any pair of values of free Qmax (calculated on free flowmetry and not, unlike the other methods, on the P/F study) and Pdetmax into one of the following 4 zones: no obstruction(0), mild obstruction (1), moderate (2) and severe obstruction (3).

5. Lemack (2000): BOO: PdetQmax ³ 21 cm H20 with Qmax £ 11 ml/sec. The results of BOO were analysed using the K-agreement test (2) to determine agreement between the methods(3). Sensitivity, specificity and diagnostic capacity of each method in detecting BOO were determined on the basis of agreement between 3/5 methods.

Results

Table 1 illustrates all the data analysed on the basis of the different urodynamic criteria in 173 patients without abdominal straining.

Table 1: 173 patients without abdominal straining

	BOO	Moderate BOO	NO BOO	Not-classified	Hypocontractile
PUMA	37	79	57	-	-
BLAIVAS	16	66	91	-	-
ROMANZI	42	-	110	17	4
CHASSAGNE	46	-	127	-	-
LEMACK	28	-	145	-	-

Table 2 shows agreement between methods for BOO according to the K-test. Table 3 shows sensitivity, specificity and overall diagnostic capacity for each method.

Table 2 K-test

	PUMA	LEMACK	CHASSAGNE	ROMANZI
BLAIVAS	**0.39**	**0.28**	**0.43**	**0.43**
ROMANZI	**0.75**	**0.68**	**0.88**	
CHASSAGNE	**0.76**	**0.70**		
LEMACK	**0.79**			

Table 3 Sensitivity, specificity and overall diagnostic capacity

	PUMA	ROMANZI	CHASSAGNE	LEMACK	BLAIVAS
SENSIBILITY	**87.8**	**95.1**	**100**	**68.2**	**90**
SPECIFICITY	**96.2**	**97.7**	**96.2**	**100**	**66.7**
DIAGNOSTIC CAPACITY	**94.2**	**97.1**	**97.1**	**92.4**	**72.2**

Conclusion

Blaivas classification does not agree with any other method because it does not use the P/F study to assess flow, thus determining the discrepancy we observed. Agreement is good between the other methods. Chassagne, Romanzi and PUMA seem to have the best sensitivity and specificity. In conclusion in evaluating BOO in women combining PUMA with the Chassagne method provides the best results (sensibility 97.5%, specificity 97.7%). Furthermore, PUMA provides information on detrusor contractility which is not otherwise available.

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