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Title: PUMA VS ROMANZI IN THE DETECTION OF FEMALE BLADDER OBSTRUCTION AND DETRUSOR CONTRACTILITY

Aim Of The Study:

The prevalence of bladder outlet obstruction (BOO) in women is still unknown particularly because there are no accepted urodynamic criteria for its diagnosis. Those used in men are not suitable for women because detrusor pressure during micturition is significantly lower. Romanzi et al. (1), assessed not only BOO but also detrusor contractility. Over the past 6 years we have been using the PUMA (2,3) to analyse data from pressure/flow (P/F) studies and to assess BOO and detrusor contractility in women. This study compared the PUMA results with the Romanzi criteria as both are based on P/F study a comparison is feasible.

Materials And Methods:

We studied 406 consecutive female pts, all neurologically normal, using our standard urogynaecological protocol which includes: case history clinical uro-gynaecological and neurological examination, dynamic micturitional ultrasonography, urodynamic and/or videourodynamic tests. Attention was focussed on previous uro-gynaecological surgery including hysterectomy, prolapse repair and incontinence correction. All pts underwent urodynamic tests according to ICS criteria. BOO was diagnosed according to 1) PUMA criteria and 2) Romanzi's parameters. PUMA uses urethral efficiency (UE), based on Pves and Qura during a P/F study, to assess BOO: $UE \geq 90$ is indicative of no obstruction; $50 \geq UE < 90$ 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; $DE > 112$ indicates hypercontractility, $87 \geq DE \leq 112$ is the normal range, $60 \geq DE < 87$ indicates hypocontractility with $DE < 60$ indicating severe hypocontractility. PUMA parameters were determined at maximum flow due to lack of other P/F data. Using Romanzi's method (1999) BOO was diagnosed when Q_{max} is < 15 ml/sec and $P_{det} Q_{max}$ is > 25 cm H₂O. Detrusor hypocontractility is diagnosed when $P_{det} max$ is < 15 cm H₂O and $Q_{max} < 15$ ml/sec. The results of BOO and detrusor contractility according to PUMA and Romanzi criteria were analysed using the Kappa test (inter-rater agreement). Agreement reference values are as follow:

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	VERY GOOD

Results:

365 pts (mean age 58.9 +/- 10.9) completed the urogynaecological protocol. 139 pts (38%) had previously undergone urogynaecological surgery and 144 (39.4%) used abdominal straining during micturition in the P/F study. Tables 1-5 report BOO assessment according to PUMA and the Romanzi criteria in different sub-

groups of patients. Table 6 indicates detrusor contractility as evaluated by the 2 methods. Using the Romanzi criteria 40 pts were not identified as either obstructed or affected by detrusor hypocontractility as the Qmax was < 15 ml/sec, the Pdet max was > 15 cm/H2O and the Pdet Qmax was < 25 cm/H2O.

The 40 non-classified pts were analysed separately using PUMA (Tab. 7).

Discussion And Conclusion:

PUMA and the Romanzi criteria are advanced urodynamic methods which assess detrusor contractility and BOO in women. The good level of agreement (K=0.65) on BOO results in the whole group did not vary in the subgroups with or without a history of uro-gynaecological surgery. However it did diverge in pts who used abdominal straining (K=0.48) and those who did not (K=0.77). The discrepancy may be due to different parameters. PUMA uses the Pves parameter to calculate UE while the Romanzi method uses Pdet. In the assesment of detrusor contractility agreement between the 2 methods is poor (K=0.09) because the Romanzi methods identifies only 9 pts with hypocontractility while PUMA detects 129. PUMA considered the 40 pts who could not be classified by the Romanzi method as either obstructed or hypocontractile. In conclusion when investigating obstruction in women Pves should be adopted rather than Pdet in the P/F study as 38% of women used abdominal straining. PUMA identifies BOO and detrusor contractility in all pts including those who escape classification with the Romanzi method.

Tab. 1 Obstruction PUMA vs Romanzi

	PUMA	No obstruction	Moderate obstruction	Severe obstruction
ROMANZI	365	92	156	117
Obstruction	90	0	13	77 (K= 0.65)
No obstruction	226	88	127	11
Non classified	40	3	13	24
Hypocontractile	9	1	3	5

Tab. 2 Obstruction in pts with previous surgery: PUMA vs Romanzi

	PUMA	No obstruction	Moderate obstruction	Severe obstruction
ROMANZI	139	41	48	50
Obstruction	37	0	4	33 (K=0.65)
No obstruction	81	39	37	5
Non classified	15	1	5	9
Hypocontractile	6	1	2	3

Tab. 3 Obstruction in pts without a hystory of surgery: PUMA vs Romanzi

	PUMA	No obstruction	Moderate obstruction	Severe obstruction
ROMANZI	226	51	108	67
Obstruction	53	0	9	44 (K=0.64)
No obstruction	145	49	90	6
Non classified	25	2	8	15
Hypocontractile	3	0	1	2

Tab. 4 Obstruction in pts with abdominal straining: PUMA vs Romanzi

	PUMA	No obstruction	Moderate obstruction	Severe obstruction
ROMANZI	144	28	57	59

Obstruction	26	0	0	26 (K=0.48)
No obstruction	91	28	53	10
Non classified	20	0	2	18
Hypocontractile	7	0	2	5

Tab. 5 Obstruction in pts without abdominal straining : PUMA vs Romanzi

	PUMA	No obstruction	Moderate obstruction	Severe obstruction
ROMANZI	221	64	99	58
Obstruction	64	0	13	51 (K=0.77)
No obstruction	135	60	74	1
Non classified	20	3	11	6
Hypocontractile	2	1	1	0

TAB. 6 Contractility: PUMA vs Romanzi

	PUMA	Severe hypocontract.	Hypocontract.	Normal	Hypercontract
ROMANZI	365	19	110	162	74
Obstruction	90	0	16	56	18
No obstruction	226	6	65	99	56
Non classified	9	6 (K=0.09)	3 (K=0.09)	0	0
Hypocontractile	40	7	26	7	0

Tab. 7 PUMA contractility vs obstruction in 40 pts not classified by Romanzi

	PUMA	Severe hypocontractility	Hypocontract	Normal	Hypercontract
	40	7	26	7	0
Severe obstruction	24	5	16	3	0
Moderate obstruction	13	0	9	4	0
No obstruction	3	2	1	0	0

References:

- 1) L.J.Romanzi et al. The effect of genital prolapse on voiding. J.Urol. 161:581-586, 1999
- 2) A new method for analysing cysto-uroflowmetric data. III. Comparison with traditional methods. Urodynamic 4:228-230, 1994
- 3) Bladder outlet obstruction and detrusor contractility vs clinical findings in women. Urodynamic 10:177-179, 2000

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