

72 Parameters for detrusor underactivity in women: Predictive value towards ineffective voiding in a large cohort of women with urinary incontinence

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Rosier P.

University Medical Center Utrecht, Dept. of Urology, Utrecht, The Netherlands

Introduction & Objectives: Detrusor underactivity (DU) is a urodynamic pressure flow, medical specialists care-diagnosis. Predominantly ineffective voiding, but also prolonged duration of voiding are clinical signs. Obstructed voiding (and not representative voiding, while tested) may result in similar signs. <https://doi.org/10.1016/j.eururo.2013.10.015>. Further definition of a clinical detrusor underactivity syndrome is hampered by the ambiguity around cut-off values for (female) detrusor underactivity. <https://doi.org/10.1016/j.eururo.2018.07.037>. A variety of parameters is available for quantification of detrusor voiding contraction, and new are being developed. <https://doi.org/10.1002/nau.23745>. Male voiding is, especially when the prostate enlarges epidemiologically more frequently affected by outflow obstruction(BOO) than female voiding. Slow voiding and or ineffective voiding may therefore be more specific signs of DU in women. We have tested pressure flow detrusor contraction quantification parameters in a large cohort of women referred with urinary incontinence.

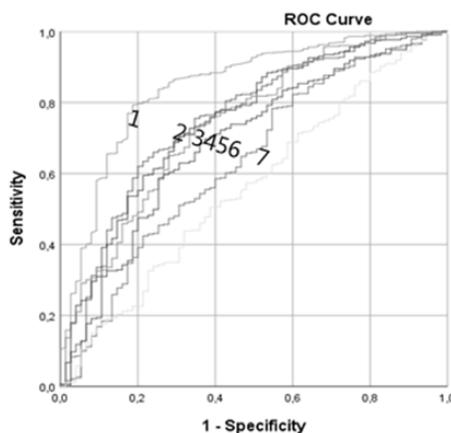
Materials & Methods: The pressure flow tests of 504 women (mean 55,5 range 20-99) that voided > 100mL, with a PVR of <500mL without significant straining and (patient reported-) representative were included. Clinical indication for UDI was SUI-s in 34,1% UUI-s in 40,1% and MUI-s 25,8%. Neurogenic dysfunction and infection, as well as pressure flow peak artifacts were excluded. p_{det} , q_{max} , q_{mean} , q_{accel} (rate increment to q_{max}), W_{max} , BCI, PIP and T_q as well as PVR were determined. URA and BOOI are used to control for BOO. Contraction parameters were tested for their ability to predict PVR and or prolonged voiding.

Results: Contraction parameters have a high correlation with residual volume and with voiding time. W_{max} has the highest coefficient. ROC curve analysis shows the superior predictive value of W_{max} . BOO (OBS) has been rare (<5% of cohort). The urodynamic diagnosis of underactive detrusor can reliably be quantified.

See figure with tables:

N 504	Mean	sd
Residual (mL)	46,2	96,2
P _{detQmax} (cmH ₂ O)	26,2	15,9
q _{max} (mL/s)	19,0	9,
q _{ave} (mL/s)	8,9	5,4
q _{accel} (mL/s ²)	3,2	17,3
W _{max} (W/m ²)	11,1	5,9
BCI	121,3	46,7
PIP	45,2	17,2
T _q (s)	79,9	83,7
URA (cmH ₂ O)	11,6	7,1
BOOI	-11,8	26,2

Outflow clinical grading		Very Weak	Weak	Normal	Strong	Total
ObsGroup	NoOBS	7	179	211	83	480
	IntermOBS	0	1	13	2	16
	OBS	0	1	5	2	8
Total		7	181	229	87	504



ROC	Area Under the Curve
1	W _{max} ,847
2	Q _{ave} ,752
3	BCI ,748
4	Q _{max} ,739
5	Q _{accel} ,636
6	PIP ,685
7	P _{detqmax} ,562

Correlations		PVR	P _{detQmax}	q _{max}	q _{mean}	q _{Accel}	W _{max}	BCI	PIP	T _q	URA	BOOI
PV-Residual	Pearson Corr		-,092*	-,234**	-,104*	,203**	-,462**	-,262**	-,209**	,149**	,074	,110*
	Sig. (1-tailed)		,047	,000	,029	,000	,000	,000	,000	,003	,087	,022
	N	335	335	335	335	335	335	335	335	335	335	335
T _q :Flowtijd (s)	Pearson Corr	,149**	-,081*	-,306**	-,360**	-,052	-,326**	-,331**	-,240**		,100*	,167**
	Sig. (1-tailed)	,003	,034	,000	,000	,120	,000	,000	,000		,013	,000
	N	335	504	504	504	504	504	504	504	504	504	504

Conclusions: Based on quantification of the clinical definition of detrusor underactivity (PVR & voiding time), cut-off values for (urodynamical) contractility parameters can be chosen to validate symptom assessment as well as proof of concept management studies. Our study demonstrated that WF (W_{max}) analysis has the highest correlation with PVR and or prolonged voiding.