

177

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Title: NORMALITY IN URODYNAMICS STUDIED IN 88 YOUNG HEALTHY VOLUNTEERS

Aims of study :

Prospectively evaluate urodynamic data in a large group of symptom-free young adults.

Methods :

After approval by the ethical committee this prospective study was opened to volunteers. A total of 46 men and 42 women, mean age 23 years (between 18 and 30) with no history, symptoms or signs of urological disease were included. The volunteers had a mean length of 175 cm (between 153 and 193) and a mean body weight of 68 kg (between 50 and 104 kg). Free flow, cystometry and pressure flow studies were performed using standard techniques.

The free flow study was done with a rotating disk flowmeter. Residual urine was measured through a 3-way 8F cystometry catheter introduced transurethally using nonanesthetic lubricant. Cystometry was performed with 6-channel urodynamic equipment. All pressure lines were fluid filled and connected to external pressure transducers. One lumen of the cystometry catheter was used for bladder pressure measurement, 1 for measurement of urethral pressure at the external sphincter and 1 for bladder filling and emptying. Abdominal pressure was measured with an 8F fluid filled catheter introduced at least 10 cm in the rectum. The catheters were fixed on the body surface with tape while the volunteers were sitting. Continuous bladder filling was done at 50 ml with sterile saline at body temperature until maximum cystometric capacity was reached. Detrusor activity was noted. A pressure flow study was performed and the residual volume measured. Statistics were done with SPSS PC programme using non parametric tests.

Results :

Several urodynamic parameters are given in table 1. In table 2, the types of detrusor and sphincter activity during bladder filling and pressure flow are given.

Table 1 = urodynamic parameters

<i>Free flow</i>	Mean	SD	Min	Max
Vol voided ml	264 *	222	10	1281
Flow time sec	22.6 *	18.4	3	101
Max flow ml/sec	22.1	11.4	5	55
Average flow ml/sec	12.9	8.4	3.2	55.6
Time to max sec	9.75 *	9.25	1	57
<i>Cystometry filling</i>				
Compliance ml/cm H2O	77	56	9	277
Max cystometric capacity ml	480 *	146	148	926
<i>Pressure flow</i>				
Vol voided ml	474 *	171	76	1074
Detrusor pressure at	42.5 *	16.3	8	99

max flow cm H2O

Flow time sec	55.6 *	30.5	9	156
Max flow ml/sec	20.3 *	9	5	47
Average flow ml/sec	9.9	4.8	2	27
Time to max sec	36.3	88.7	3	751

*= significant difference between men and women

Table 2 = Detrusor activity, sphincter activity during filling and micturition, flow pattern in free flow and pressure flow.

Detrusor activity		Flow pattern		Total
<i>During filling</i>		<i>Free flow (n = 50)</i>		
Overactive	11	Normal	31	
Normoactive	77	Voided 2x	4	
<i>During micturition</i>		Slow start	6	
Normoactive	37	Long flow + low max flow		1
Hypoactive	4	Undulating during entire flow		8
Normoactive + after contraction		20	<i>Pressure flow</i>	
Straining + detrusor contraction		17	Normal	32
		Undulating during entire flow		24
Sphincter activity		Undulating only at end flow		4
<i>During filling</i>		Undulating only at beginning		3
Stable + gradual pressure rise		22	flow	
Stable without gradual pressure rise		14	Voided 2x	8
Stable + gradual pressure loss		11	Slow start	6
Unstable		41		
<i>During flow</i>				
Relaxing		53		
Intermediate relaxing		15		
Nonrelaxing		4		
Catheter moved		8		

Conclusions : Most urodynamic parameters show large variations, demonstrating that urodynamic normality in a symptom-free population may correspond with a wide variety of data and patterns. Numeric urodynamic data considered primarily as pathological can also be found in asymptomatic volunteers. Technical urodynamics should be interpreted with caution. The diagnosis with urodynamics should consist of reproducing symptoms and correlate those symptoms with the urodynamic data. Urodynamic data on their own do seem to have little diagnostic value.