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Title: THE NORMAL PATTERN OF PERCEPTION OF BLADDER FILLING DURING CYSTOMETRY STUDIED IN TWO GROUPS OF YOUNG HEALTHY VOLUNTEERS WITH 5 YEARS INTERVAL.

Aims of study :

To evaluate the pattern of sensation during the tonic phase of cystometric bladder filling in two distinct groups of young healthy volunteers investigated in 1995 and 2000 and compare the results obtained.

Methods :

After approval of the ethical committee in 1995 and in 2000, a group of young healthy volunteers were prospectively included in an evaluation study on the pattern of sensation perceived during cystometry. The 1995 group (Group A) consisted of 28 male and 10 female persons and the 2000 group (Group B) of 18 male and 32 female volunteers. The age was slightly different with a mean age of 24.2 in group A and 22.2 in group B. Weight and length were not different between groups. All were symptomfree, were in good health and had no urological history.

An 8F 3 lumen catheter with 2 pressure lines was introduced using a nonanesthetic lubricant. The bladder was emptied. A 1 lumen catheter to measure rectal pressure and a 6 channel urodynamics unit were used. The volunteers were sitting while the bladder was filled with body warm saline. They were asked to report all sensations related to the bladder filling immediately, to describe and localize the sensations, to ignore the sensations and to indicate when sensations returned. No explanation was given beforehand of what they might sensing during the test. Each sensation was marked on the cystometric curve, and volunteers were blinded to the filling bag, pump and screen. The filling ended when the subjects had the sensation that the bladder was full. Statistically analysis with the SPSS.PC programme and non parametric tests was used. The study was done in each group by another investigator.

Results :

All 88 volunteers mentioned spontaneously the same sensory pattern consisting of a first sensation of bladder filling (FSF), first desire to void (FDV) and strong desire to void (SDV).

The FSF was vague, and localized in the lower pelvis. It could easily be ignored for a minute or two while filling continued. FDV was recognized as a familiar constant sensation in the lower abdomen that normally persuades a person to have micturition soon. It could be ignored for 10-20 seconds. SDV corresponded with a constant perineal sensation which would urge some one to immediately search for a place to void. It was the uncomfortable sign that the bladder was full.

Bladder volumes and detrusor pressure at each sensation are given in table 1 for both groups. A significant correlation existed between volumes and between detrusor pressures at FSF, FDV and SDV. Between group A and B only volume and pressure at SDV were statistically different and only in men ($p = 0.043$ for pressure and $p = 0.006$ for volume). FSF was noticed at a mean of 41% (Group A) and 42% (Group B) of the volume at SDV (NS = not statistically different). FDV was mentioned at a mean of 59% (Group A) and 64% (Group B) (also NS).

Sensation	Group 1995		Group 2000	
	Men	Women	Men	Women
FSF Vol ml	253 ± 124	154 ± 92	222 ± 151	175 ± 95
Pressure cm H20	7.1 ± 8	5 ± 4.7	2.6 ± 1.9	3.2 ± 1.9
FDV Vol	326 ± 148	211 ± 93	325 ± 141	272 ± 106
Pressure	9.3 ± 8.8	6 ± 4.2	4.3 ± 3.6	4.9 ± 2.8
SDV Vol	563 ± 134	456 ± 143	453 ± 93 *	429 ± 153
Pressure	12.4 ± 10.8	7.3 ± 5	5.4 ± 3.7 *	7.3 ± 4.9

Range of volumes and pressures at which sensations are reported :

Volumes : FSF between 7 ml and 758 ml, FDV between 103 ml and 833 ml, SDV between 148 ml and 926 ml.

Pressures : FSF between 1 and 33 cm H20, FDV 1 and 33 cm H20, SDV 1 and 39 cm H20.

Conclusion :

This study confirms that a normal pattern of sensation of bladder filling during cystometry exists as found in two comparable populations of healthy volunteers evaluated in 1995 and in 2000 by two different investigators.

Though, the reporting of sensation is subjective it is a valuable diagnostic tool which is easy to be used in all patients who are evaluated with filling cystometry.

The numeric data of volume and pressure at which sensations are reported can however more difficult be used to diagnose sensory pathology as the range in a normal population is already very wide. Looking at our figures in 88 young healthy people hypersensitivity for filling would correspond with FDV occurring below ± 100 ml and SDV below ± 150 ml when the bladder if filled at 30-50 ml/min. Hyposensitivity is more difficult to grade as in our normal volunteers FDV at > 800 ml and SDV at almost 1000 ml was seen. Absence of sensation is, as known, very suggestive of neuropathy.