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THE INFLUENCE OF BLADDER OUTLET OBSTRUCTION ON BLADDER SENSATION: A RETROSPECTIVE STUDY OF URODYNAMIC DATA

Hypothesis / aims of study
To investigate the relationship between bladder outlet obstruction (BOO) and bladder sensation.

Study design, materials and methods
A retrospective analysis was performed on the urodynamic study records of 730 patients who presented to the urology department of our hospital between August 2008 and December 2011. Cases with BOO index >40 and residual urine volume ≤100 ml were selected as BOO group, while female stress urinary incontinence cases with BOO index ≤40, residual urine volume ≤100 ml and Q_{max} ≥15 ml/s were selected as control group. Patients with residual urine volume >100 ml, neurological disorder, diabetes mellitus, urinary tract infection, bladder calculus and tumor were excluded from study. The bladder volumes when first sensation of bladder filling (FS), first desire to void (FD) and strong desire to void (SD) occurred were compared between the two groups. Additionally, the volume differences between FD and FS (FD-FS) and between SD and FD (SD-FD) were calculated and analyzed in the two groups. Additional analysis was performed on the old patients with age between 60 and 75 years. The data were compared using student's t-test.

Results
Out of the 730 cases, 43 patients were enrolled in BOO group (average age 62.65, range 17 to 84 years), and 58 patients in control group (average age 52.79, range 16 to 76 years). In patients with age between 60 and 75 years, the data were 19 (average age 68.74, range 62 to 75 years) and 12 (average age 67, range 61 to 75 years) respectively. In BOO group, the value of FS, FD, SD, FD-FS and SD-FD were significantly smaller than the control group (P<0.05) (Table 1). In the age between 60 and 75 years cases, the value of FS, FD, SD and FD-FS were still smaller (P<0.05), while SD-FD was not statistically different (P>0.05) (Table 2). The results were not changed when excluding the detrusor overactivity cases. In all the BOO cases, patients with detrusor overactivity showed lower values in FS, FD, SD compared to patients without detrusor overactivity (P<0.05). And the value of FD-FS and SD-FD were not statistically different (P>0.05) (Table 3).

Interpretation of results
Bladder outlet obstruction is very common in the old patients and it usually accompanies with abnormal bladder sensation. In this study, the bladder volume of strong desire to void in the control group (416.5172±130.64002 ml) is similar to the bladder capacity of a study without bladder outlet obstruction (419.2±142 ml)(1); therefore, our selection of control group probably does not affect the validity of our findings. The volume differences mentioned in the present study (FD-FS and SD-FD) may represent the time length between two bladder sensations. This study showed that the subjective clinical symptoms of bladder sensation could be compared through objective urodynamic findings, such as the value of FS, FD, SD, FD-FS and SD-FD.

Concluding message
After bladder outlet obstruction, the bladder sensitivity appears to increase, and patients accompanied with detrusor overactivity seem to increase more.

Table 1. Bladder sensation comparison between BOO group and control group (means ± standard deviation).

	BOO（n=43）	Control（n=58）	P
FS（ml）	154.8837 ± 64.00417	224.5172 ± 76.13198	<0.001
FD（ml）	216.5581 ± 88.81825	327.9655 ± 99.41707	<0.001
SD（ml）	261.4186 ± 114.95366	416.5172 ± 130.64002	<0.001
FD-FS（ml）	61.6744 ± 44.71802	103.4483 ± 54.48553	<0.001
SD-FD（ml）	44.8605 ±55.43146	88.5517 ± 61.65557	<0.001

BOO: bladder outlet obstruction.

Table 2. Bladder sensation comparison between BOO group and control group in age between 60 and 75 years cases (means ± standard deviation).

	BOO（n=19）	Control（n=12）	P
FS（ml）	148.1579 ± 67.90129	225.0833 ± 70.23268	0.005
FD（ml）	211.5789 ± 85.19215	325.7500 ± 113.61748	0.003
SD（ml）	270.2632 ± 107.62622	391.0000 ± 135.71159	0.011
FD-FS（ml）	63.4211 ± 38.03407	100.6667 ± 52.19776	0.029
SD-FD（ml）	58.6842 ± 42.95870	65.2500 ± 35.12607	0.661

BOO: bladder outlet obstruction.

Table 3. Bladder sensation comparison between patients with and without detrusor overactivity in BOO group (means ± standard deviation).

	DO（n=14）	NDO（n=29）	P
FS（ml）	117.1429 ± 61.51155	173.1034 ± 57.72431	0.006
FD（ml）	175.4286 ± 94.01040	236.4138 ± 80.47072	0.033
SD（ml）	202.0000 ± 108.14520	290.1034 ± 108.50818	0.017
FD-FS（ml）	58.2857 ± 57.73737	63.3103 ± 37.99070	0.734
SD-FD（ml）	26.5714 ± 29.35385	53.6897 ± 62.93597	0.134

DO: detrusor overactivity, NDO: without detrusor overactivity.

References

1. Wadie BS. Primary nocturnal enuresis persistent to adulthood, functional evaluation". Neurourol Urodyn 2004;23:54-57.

Disclosures

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