

CYSTOMETRY IN CONSCIOUS MICE – CORRELATION OF MICTURITION PATTERN AND BLADDER WEIGHT AFTER OUTLET OBSTRUCTION**Aims of Study**

Partial bladder outlet obstruction (BOO) is an established tool to investigate bladder overactivity in animals. Nonetheless the micturition pattern achieved by BOO can vary. In conscious mice overactivity with increased frequency and decreased micturition volumes can be found, but also bladders with increased threshold pressures and normal micturition volumes. The aim of this study was to investigate the correlation between these micturition patterns and the bladder weight after one week of BOO in a mouse model of outlet obstruction.

Methods

Female MNRI mice (average body weight 26±1g) were used for this study. In 18 mice a moderate outlet obstruction was created according to a standardized method. After 5 days of BOO a catheter was inserted into the bladder dome, tunnelled subcutaneously, and let out through a dorsal skin incision in the neck region of the animals. After 2 days (day 7 after BOO) a cystometry without anaesthesia or restraint was performed in a metabolic cage, using NaCl at a filling speed of 1.5 ml/h. Ten unobstructed animals served as controls and received the catheter 2 days prior to the cystometry. Since previous studies have shown that sham operation does not cause overactivity, no sham surgery was performed. Values are given as mean ± SEM, students t-test and Bonferoni correction were performed as appropriate, p<0.05 was required for statistical significance.

Results

Cystometry revealed marked differences in the urodynamic parameters not only between non-obstructed and obstructed mice, but also between the obstructed animals. Nine of the 18 obstructed animals developed an overactive voiding pattern with significantly increased frequency and decreased micturition volumes, but no increase in bladder weight (table 1). These animals also showed increased non-voiding detrusor activity (fig. 1). The remaining 9 animals showed mainly normal micturition volumes, but significantly increased bladder weights, increased micturition threshold pressure, and often non-voiding detrusor activity, which increased prior to micturition (table 1, fig. 1).

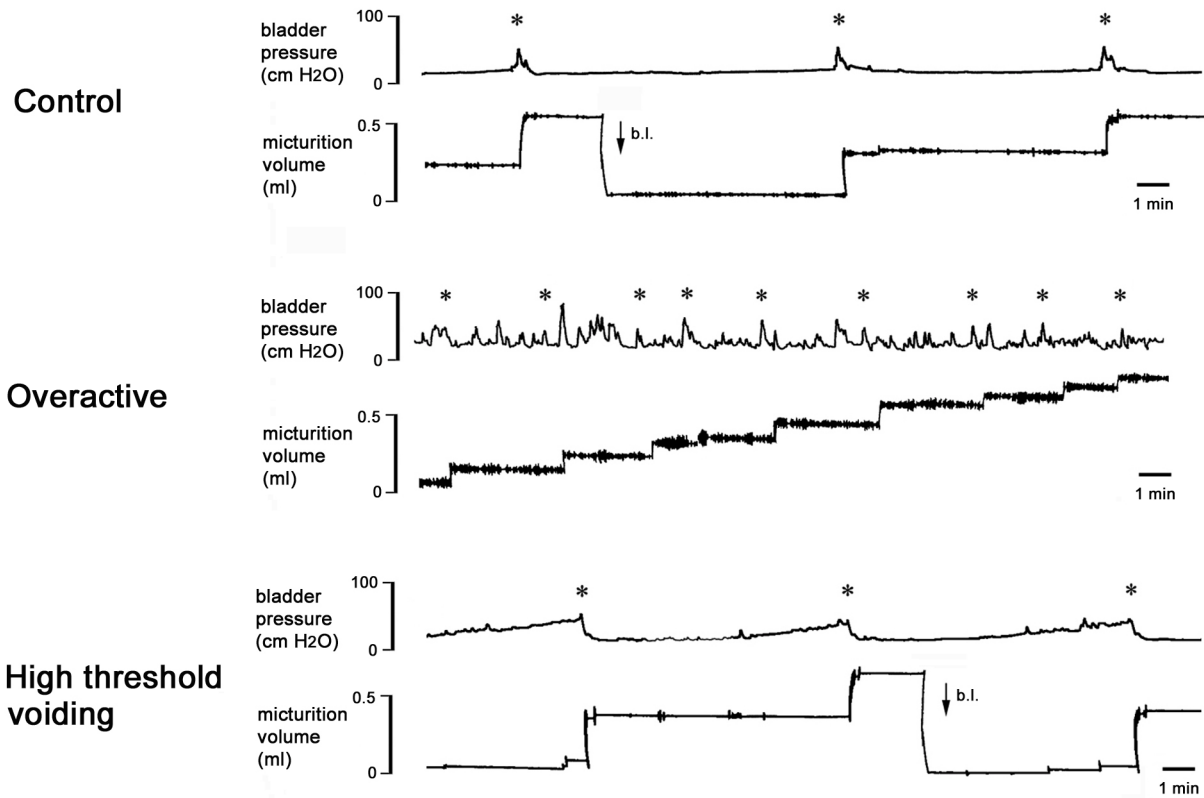
Table 1

	Controls (n = 10)	High threshold voiding (n = 9)	Overactive (n = 9)
Bladder weight (mg)	46.3 ± 2.6	79.0 ± 10.2 *	50.0 ± 3.8
MI (min)	8.4 ± 0.7	7.6 ± 0.5	2.7 ± 0.3 *
MP (cm H ₂ O)	41.3 ± 2.1	43.4 ± 4.0	47.5 ± 1.7
TP (cm H ₂ O)	10.4 ± 1.5	30.9 ± 1.7 *	13.2 ± 1.1
BP (cm H ₂ O)	7.2 ± 1.1	9.4 ± 1.5	9.4 ± 1.0
MV (ml)	0.21 ± 0.02	0.18 ± 0.02	0.06 ± 0.01 *

Values represent mean ± SEM, * p< 0.05 vs. controls.

MI micturition interval; MP micturition pressure; TP threshold pressure; BP basal pressure; MV micturition volume.

Fig 1



Conclusions

Already one week after BOO, marked changes occurred in urodynamic parameters. Two different micturition patterns were demonstrated: Detrusor overactivity was found without concomitant changes in bladder weight, and an increase in bladder weight correlated with a voiding pattern characterized by normal micturition volumes and increased micturition pressure threshold.

These results show that overactivity may develop without bladder hypertrophy. The characteristics of the functional disturbances do not seem to be only a function of time, but may also be dependent on the severity of the obstruction.