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CAN BLADDER OUTFLOW OBSTRUCTION BE DIAGNOSED FROM THE PRESSURE-FLOW ANALYSIS OF AN INVOLUNTARY VOID?

Aims of Study

Controversy exists regarding the reliability and validity of pressure-flow parameters recorded during voiding on an involuntary (unstable) detrusor contraction. The aim of this study was to investigate whether a diagnosis of bladder outflow obstruction could be established from pressure-flow analysis of an involuntary void.

Methods

Seventy-nine men (median age 69, range 30 - 89 years), with lower urinary tract symptoms, were identified prospectively during a 28 month period. For each subject, 2 sequential pressure-flow studies were performed during the same session. Medium fill conventional cystometry was performed in the standing position. Pressure-flow data were recorded during both a voluntary and involuntary void for each subject. Pressure-flow parameters were compared using the paired t-test and differences in classification (according to the ICS nomogram) were analysed using the Chi-squared test.

Results

In 72 cases, the first void resulted from an involuntary detrusor contraction, while in 7 cases a voluntary void was first recorded. The maximum flow rate (Qmax) showed no significant difference between voluntary and involuntary voiding (Table 1). Detrusor pressure at maximum flow (PdetQmax) demonstrated a small, statistically significant (but not clinically significant) increase during involuntary voiding. This was reflected in a small increase in the calculated Abrams-Griffiths number although overall, the diagnostic classification (using the ICS nomogram) remained unchanged in 64/79 (80%) men (Table 2). In no case was the diagnosis altered from bladder outflow obstruction to non-obstruction (or vice versa) when comparing the 2 pressure-flow studies. We found a statistically, and probable clinically, significant increase in both maximum detrusor pressure (Pdetmax) and detrusor pressure at initiation of voiding (Pdetopen) during involuntary voiding.

Table 1

	Unstable void (mean ± S.D.)	Stable void (mean ± S.D.)	95% CI (difference in means)	Difference (%)	P value
PdetQmax ($cmsH_20$)	73.2 ± 32.2	65.8 ± 33.1	4.07 to 10.7	-10.0	<0.00001
Qmax (mls/sec)	7.08 ± 3.41	7.58 ± 6.53	-2.04 to 1.03	+ 7.12	0.51
Pdetmax ($cmsH_20$)	93.8 ± 37.7	74.8 ± 37.6	15.5 to 22.4	-20.3	<0.00001
Pdetopen ($cmsH_20$)	79.8 ± 38.5	53.9 ± 36.1	20.9 to 30.9	-32.5	<0.00001
Pdetclose ($cmsH_20$)	37.3 ± 24.9	33.0 ± 21.7	0.96 to 7.64	-11.5	0.012
AG number	59.7 ± 35.4	52.7 ± 34.6	4.04 to 9.91	-11.7	<0.00001

Table 2

	Unstable void	Stable void
Obstructed	56	48
Equivocal	17	24
Unobstructed	6	7

$\chi^2 = 1.89$; $p = 0.39$

Conclusions

This study suggests that the small rise in detrusor pressure observed during an involuntary void does not change the diagnostic classification, obtained using the ICS nomogram, in 80% men. This compares favourably with the known intra-individual variations seen in repeated pressure-flow studies in men voiding with sequential voluntary contractions (1). The increase in Pdetmax and Pdetopen may reflect failure of relaxation of the striated sphincter at the start of an involuntary void, or alternatively, at the start of the first, less familiar, voiding study. The results provide evidence that bladder outflow obstruction can be reliably diagnosed on the basis of the pressure-flow parameters recorded during an involuntary void.

References

1. Hansen F, Olsen L, Atan A, Jakobsen H, Nordling J. 1997. Pressure-flow studies: An evaluation of within-testing reproducibility - validity of the measured parameters. Neurourol Urodynam 16; 521-532.