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Title (type in CAPITAL LETTERS)	PRESSURE-FLOW STUDY FOR BLADDER OUTLET OBSTRUCTION IN FEMALE: A PROSPECTIVE STUDY

AIMS OF STUDY

There is some controversy in the literature as to standardized definition of bladder outlet obstruction (BOO) in female (1,2). Also there is no accepted urodynamic criteria of BOO in women. We attempted to find out useful urodynamic parameters for the diagnosis of BOO in women.

METHODS

Two groups, control and clinically BOO patients were studied prospectively from September 1998 to January 1999. All had a complete history, physical examination, normal neurologic evaluation, uroflowmetry, and urodynamics (pressure-flow study with 6 Fr. triple lumen catheter). The control group consisted of women with stress urinary incontinence who had no previous history of pelvic surgery or urethral pathology. The obstructed group was defined by their obstructive symptoms, peak flow < 12 ml/s in uroflowmetry (2), significant residual urine (> 50 ml), and good detrusor contraction. To predict obstruction, comparisons were made between two groups; receiver operator characteristic (ROC) curve analysis was used to determine the optimum cutoff values for peak flow rate (Q_{max}), detrusor pressure at maximum flow ($P_{detQmax}$), free flow residual urine (FFRU), CMG flow residual urine (CFRU) and maximal urethral closing pressure (MUCP).

RESULTS

One hundred and three patients were available for the analysis, of which 17 were obstructed by clinical definition and 87 served as a control. Three women who were not met aforementioned criteria were excluded. Obstructed group was consisted of the patients with previous anti-incontinence surgery (7 pts.), urethral stricture (3 pts.) and idiopathic or functional obstruction (7 pts.). Q_{max} in pressure-flow study for the control group was 17.6 ± 0.9 ml/s (mean \pm SD) and for the obstructed group, 7.9 ± 0.8 ml/s (student t-test, $P < 0.05$). $P_{detQmax}$ for the control group was 31.1 ± 1.7 cmH₂O and for the obstructed group, 55.3 ± 5.4 cmH₂O ($P < 0.05$). FFRU and CFRU for control group were 27.6 ± 8.2 ml, 38.5 ± 8.4 ml and for obstructed group, 39.5 ± 9.1 ml and 174.6 ± 36.0 ml, respectively. During pressure-flow study, residual urine was much more exaggerated in obstructed group than in control group ($P < 0.05$). MUCP for the control group was 57.5 ± 2.0 cmH₂O and for the obstructed group, 97.3 ± 2.9 cmH₂O ($P < 0.05$). On the basis of ROC curves, using cutoff values of $Q_{max} < 12$ ml/s and < 10 ml/s, sensitivity were 93.8% and 75.0%, and specificity 78.0% and 89.0%, respectively. Using $P_{detQmax} > 40$ and > 30 cmH₂O, sensitivity were 75.0% and 100%, and specificity 77.1% and 54.2%. Using MUCP > 80 cmH₂O, sensitivity was 94.1% and specificity 84.0%. Because the ranges of FFRU and CFRU were too wide in both groups, these parameters



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were not valid. Using a combined cutoff value of $Q_{max} < 12$ ml/s and $P_{detQmax} > 30$ cmH₂O, sensitivity was 93.8% and specificity, 91.5%. Using a combined cutoff value of $Q_{max} < 12$ ml/s, $P_{detQmax} > 30$ cmH₂O, and MUCP > 80 cmH₂O, sensitivity was 85.4% and specificity, 95.2%. Although the sensitivity of cutoff value by three parameters (Q_{max} , $P_{detQmax}$ and MUCP) was lower than that by two parameters (Q_{max} and $P_{detQmax}$), the specificity of the former was higher than that of the latter.

CONCLUSIONS

Although the exact diagnosis of BOO in female on the basis of pressure-flow parameters is difficult, our results show that BOO might be diagnosed by the criteria of $Q_{max} < 12$ ml/s, $P_{detQmax} > 30$ cmH₂O, and MUCP > 80 cmH₂O. Residual urine volume does not seem to be of valid predictive value in our study. MUCP, however, could be an additional parameter for the diagnosis of BOO if combined with pressure-flow plot.

REFERENCES

1. Proposed cutoff values to define bladder outlet obstruction in women. Urology 1988; 51:408-411.
2. Obstructed voiding in the female. Br J Urol 1988; 61:36-39.