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BLADDER OUTLET OBSTRUCTION IS ASSOCIATED WITH OVERACTIVE BLADDER SYMPTOMS AND DETRUSOR OVERACTIVITY IN MEN WITH BENIGN PROSTATIC ENLARGEMENT ASSOCIATED WITH DETRSOR OVERACTIVITY

Hypothesis / aims of study

To investigate the association of the degree of bladder outlet obstruction (BOO) with urodynamic parameters of detrusor overactivity (DO) and the severity of symptoms related to overactive bladder (OAB) in patients with symptomatic benign prostatic enlargement (BPE) associated with DO.

Study design, materials and methods

All symptomatic BPE men who had undergone transurethral resection of the prostate (TURP) in our hospital between January 1993 and December 2000 were retrospectively reviewed. Those who had urinary tract infection, bladder stones, bladder cancer, previously diagnosed or suspected carcinoma of the prostate, disease with BOO other than BPH (i.e urethral stricture), neurologic disorders and any other conditions and drug treatment that might interfere with bladder function, urine production rate, or voiding habits were excluded from this study. Only those who had DO confirmed by preoperative full urodynamic investigation including pressure flow study (PFS) were included in this study. Of 777 patients with BPE who had undergone TURP, 317 were associated with DO and those with complete data of urodynamic parameters of detrusor as well as urodynamic parameters of DO for statistical analysis were selected, thus resulting of 231 cases being enrolled into the final analysis. The severity of the symptoms related to OAB (urgency, nocturia and frequency) were graded based on IPSS. Preoperative evaluations including urodynamics with PFS were performed. Maximum urinary flow rate obtained from uroflowmetry and urodynamic parameters of detrusor pressure at peak urinary flow rate (Pdet.Qmax) and maximum detrusor pressure (Pdet.max) were identified. The degree of bladder outlet obstruction (BOO) based on bladder outlet obstruction index index (BOOI:Pdet.Qmax – 2Qmax), the provisional International Continence Society (ICS) nomogram for the purpose of standarization in the diagnosis of BOO in male patients, were calculated and analysed. The urodynamic parameters of DO included the amplitude of DO or maximum DO pressure (MDOP), the time for MDOP ($MDOP_{time}$), the ratio of MDOP to $MDOP_{time}$ ($MDOP_{velocity}$), the duration of DO (DO_{time}), the detrusor pressure at the beginning of the first DO (Pdet@FDO) and the bladder filling volume at the beginning of the first DO (BV@FDO). If more than one episode of DO occured during urodynamic study,only the parameters the predominant DO was analysed except for Pdet@FDO and BV@FDO which by definition is measured at the first episode of DO (**Figure 1**). Spearman correlation test was used for statistical analysis of the associations of the degree of BOO with urodynamic parameters of DO and the severity of symptoms related to OAB.

Results

Of the 231 symptomatic BPE associated with DO patients with mean (SD) of age 72.7 (7.0) and prostate volume 46.9 (19.5), 200 patients were categorized as obstructed, 24 patients were equivocal and 7 patients were unobstructed based on BOOI. The degree of BOO based on BOOI was significantly associated with MDOP (r = 0.292, p = 0.000), $MDOP_{velocity}$ (r = 0.135, p = 0.040), DO_{time} (r = 0.133 , p = 0.044), Pdet@FDO (r = 0.230, p = 0.000) (**Figure 2**), the severity of urgency symptoms (r = 0.172, p = 0.009), and prostate volume (r=0.212, p=0.001). In addition, detrusor pressure (Pdet.Qmax and Pdet.max) were positively correlated with the severity of urgency symptoms (r=0.177, p=0.007 and), MDOP(r=0.308, p =0.000 and r=0.274, p=0.000), $MDOP_{velocity}$ (r=0.140, p = 0.033 and r=0.150, p=0.022), Pdet@FDO (r=0.237, p =0.000 and r=0.218, p=0.001) and prostate volume (r=0.219, p=0.001 and r=0.181, p=0.006), and negatively correlated with age (r= - 0.136, p=0.041 and r= - 0.166, p=0.012).

Interpretation of results

The analyses of urodynamic parameters of DO was reported previously to be important in association with the severity of symptoms related to OAB.(1) The evidence of significant increase of MDOP, $MDOP_{velocity}$, DO_{time} and Pdet@FDO with the increase of BOO may responsible for the significant higher of urinary urgency scores since the higher pressure and velocity with longer duration of non voiding detrusor contraction will effectively induce urgency sensation by stimulation of fast stretch receptors from fast stretch of relaxed muscle cell areas surrounding contracting muscular zones in bladder wall.(2) The facilitation of detrusor pressure in urodynamic parameters of DO (MDOP, $MDOP_{velocity}$, and Pdet@FDO) may also responsible for the significant higher degree of urinary urgency symptoms. The higher detrusor pressure will be followed by higher MDOP, $MDOP_{velocity}$ and Pdet@FDO and higher degree of urinary urgency symptoms.

Concluding message

The association of the degree of BOO with the severity of urgency symptoms, the cornerstone symptom of OAB, was confirmed in symptomatic BPE associated with DO patients. Its association with the amplitude of DO, DO_{time}, $MDOP_{velocity}$ and Pdet@FDO were also confirmed in this group of patients. The facilitation of detrusor pressure in urodynamic parameters of DO may act as the determinant factors and responsible for the higher degree of urgency symptoms.

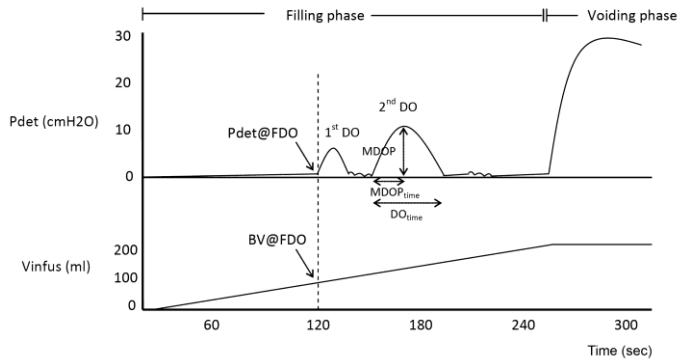

Figure 1. The urodynamic parameters of non voiding detrusor contraction.

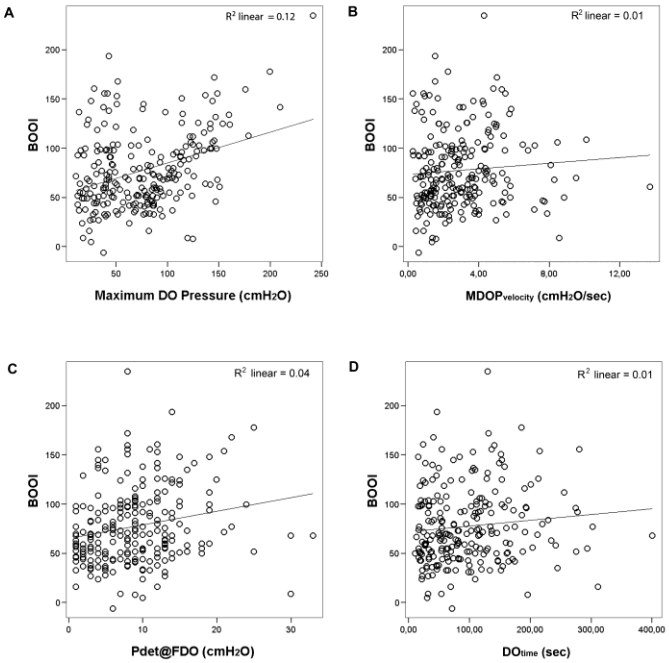

Figure 2. The association of urodynamic parameters of DO with the degree of BOO. The amplitude of DO (A), $MDOP_{velocity}$ (B), Pdet@FDO (C), DO_{time} (D) were significantly associated with BOOI.

References

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Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require eithics committee approval because	**This is a retrospective study**
Was the Declaration of Helsinki followed?	**No**
This study did not follow the Declaration of Helsinki in the sense that	**This is a retrospective study**
Was informed consent obtained from the patients?	**No**