

IMPROVEMENT OF OVERACTIVE BLADDER WITH DUTASTERIDE IN PATIENTS WITH LOWER URINARY TRACT SYMPTOMS SUGGESTIVE OF BENIGN PROSTATIC OBSTRUCTION: ANALYSIS OF BLADDER VASCULAR RESISTANCE USING COLOR DOPPLER ULTRASONOGRAPHY

Hypothesis / aims of study

Previous studies have suggested that bladder ischemia is involved in the pathophysiology of overactive bladder (OAB) associated with benign prostatic obstruction (BPO). Color Doppler ultrasonography (CDUS) is a useful method to investigate bladder ischemia in patients with lower urinary tract symptoms suggestive of BPO (LUTS/BPO). At 40th annual meeting of the ICS in Toronto, we reported about bladder vascular resistance in patients with LUTS/BPO before and after transurethral resection of the prostate (TURP). In that report, we showed that higher bladder vascular resistance was associated with larger prostate volume (PV) and severer obstruction and that less improvement of bladder vascular resistance after TURP was associated with postoperative persistent OAB.

As the second study with CDUS, we investigated the effect on bladder ischemia of dutasteride that can improve OAB symptoms as well as voiding symptoms in patients with LUTS/BPO.

Study design, materials and methods

A prospective study was conducted in consecutive 30 patients with LUTS/BPO who had not been satisfied with alpha-adrenergic antagonist monotherapy. Inclusion criteria were PV \geq 30 ml and IPSS \geq 8 or QOL index \geq 3 under administration of any alpha-adrenergic antagonist (silodosin in 21 patients, tamsulosin in 6, and naftopidil in 3) without anticholinergic agent. Before and 24 weeks after dutasteride (0.5 mg daily) add-on treatment with preceding alpha-adrenergic antagonist, we assessed all patients using IPSS, uroflowmetry, filling cystometry, pressure-flow study (PFS) and CDUS. The dose of alpha-adrenergic antagonist was not changed during the 24-week study period. Using CDUS, arterial blood flow of lateral bladder wall was examined and resistive index (RI = $[V_{\max} - V_{\min}] / V_{\max}$) was calculated as a variable of bladder blood flow. We examined the correlations of RI with PV or urodynamic parameters and also relationship between the changes in RI and improvement of OAB by dutasteride.

Results

Mean RI before dutasteride was significantly higher in patients with PV 60 ml or greater (N=17) than in those with PV less than 60 ml (N=13) (0.568 ± 0.059 vs. 0.521 ± 0.082 , $p < 0.05$). However, there was no significant correlation between RI and obstruction grade by the Schäfer nomogram. Twenty-four weeks after dutasteride, PV significantly decreased from 68 ± 29 to 48 ± 28 ml ($p < 0.001$), and there was significant improvement of IPSS (from 18.8 ± 7.7 to 13.4 ± 7.2 , $p < 0.001$), QOL index (from 4.6 ± 1.0 to 3.4 ± 1.3 , $p < 0.001$) and maximum flow rate (Qmax) (from 12.5 ± 6.1 to 14.7 ± 7.7 ml/sec, $p < 0.05$). Urgency score of IPSS was also significantly improved from 2.4 ± 1.9 to 1.4 ± 1.4 ($p < 0.01$) after dutasteride. On filling cystometry and PFS, obstruction grade (from 3.2 ± 1.6 to 2.4 ± 1.4 , $p < 0.01$), detrusor pressure at Qmax (PdetQmax) (from 71 ± 33 to 54 ± 25 cmH₂O, $p < 0.001$) and amplitude of detrusor overactivity (DO) (from 46 ± 34 to 22 ± 22 cmH₂O, $p < 0.001$) were significantly improved. Among 23 patients who had DO before dutasteride, DO disappeared completely in 6 patients after dutasteride. RI significantly decreased after dutasteride (from 0.548 ± 0.069 to 0.486 ± 0.064 , $p < 0.001$).

In 20 patients with persistent urgency after dutasteride, RI was less improved than in other 10 patients without urgency (change of RI 0.045 vs. 0.096 , $p < 0.05$). Posttreatment PdetQmax in patients with persistent urgency was significantly higher than in those without urgency after dutasteride (61.5 ± 26.3 vs. 39.5 ± 16.6 cmH₂O, $p < 0.01$), and posttreatment obstruction grade in patients with persistent urgency tended to be higher than in those without urgency after dutasteride (2.7 ± 1.4 vs. 1.8 ± 1.0 , $p = 0.06$).

Interpretation of results

Bladder vascular resistance was higher in patients with larger PV and decreased along with reduction of PV by dutasteride. Thus prostatic enlargement itself seems to play an important role in the development of bladder ischemia. The result that there was no significant correlation between bladder vascular resistance and obstruction grade might be attributable in part to the small sample size in the present study. Although dutasteride relieved BPO and reduced PdetQmax in the whole patients, obstruction grade and PdetQmax after dutasteride was higher in patients with persistent OAB than in those without. In the patients with persistent OAB after dutasteride, bladder vascular resistance was less improved. Resolution or persistence of OAB after dutasteride seems to be related to the degree of improvement of outflow obstruction and bladder ischemia.

Concluding message

Bladder vascular resistance in patients with LUTS/BPO is elevated in correlation with PV and decreases significantly after dutasteride treatment. Less reduction of vascular resistance after dutasteride is related to posttreatment OAB. Persistent obstruction and bladder ischemia seem to be the causative factors of persistent OAB after dutasteride treatment.

Disclosures

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