

EFFECTS OF TADALAFIL ON STORAGE AND VOIDING FUNCTION IN PATIENTS WITH MALE LOWER URINARY TRACT SYMPTOMS SUGGESTIVE OF BENIGN PROSTATIC HYPERPLASIA, BASED ON A URODYNAMIC STUDY

Aims of study

Tadalafil is the only PDE5-inhibitor approved for patients with lower urinary tract symptoms (LUTS) suggestive of BPH (LUTS/BPH). Smooth muscle relaxation in the bladder, urethra, and prostate due to increased nitric oxide/cGMP pathway activity via inhibition of PDE5 isoenzymes and the increase blood perfusion to the pelvic area was reported to be the mechanism of LUTS improvement with tadalafil. However, some papers reported that tadalafil did not reveal a significant improvement in urinary flow rate as compared with placebo^{1,2}. Although tadalafil has been shown to improve LUTS significantly, little is known about its effect on lower urinary tract dysfunction. Some issues remain to be investigated, including the discrepancy between the improvement in subjective symptoms and objective findings with tadalafil. The principal aim of this study was to determine whether tadalafil has an objective effect on storage function and bladder outlet obstruction (BOO) in patients with LUTS/BPH, based on urodynamic study (UDS).

Materials and methods

This was an open-labeled, single-center, prospective study. Eighty untreated outpatients with LUTS/BPH received tadalafil 5 mg/day for 12 weeks.

The International Prostate Symptom Score (IPSS), IPSS-QOL, Overactive Bladder Symptom Scores (OABSS), and BPH impact index (BII) were measured before and after drug administration to evaluate subjective symptom severity and QOL. Patients also underwent UDS, including uroflowmetry, cystometrogram, and pressure flow study (PFS), to evaluate their lower urinary tract function before and 12 weeks after administration.

First desire to void (FDV), maximum cystometric capacity (MCC), and detrusor overactivity (DO) were assessed as parameters of storage function. Maximum urinary flow rate (Q_{max}), post-void residual urine volume (PVR), detrusor pressure at Q_{max} (P_{det}Q_{max}), and bladder outlet obstruction index (BOOI) were evaluated as parameters of voiding function.

Results

Of 80 patients who met the entry criteria, 4 (5.0%) discontinued treatment owing to adverse reactions, including headache (n = 2), problem on erection (n = 1), and dizziness (n = 1). One patient developed urinary retention during the study period. UDS was not performed after treatment in 4 patients. As a result, the analysis included 71 patients with a mean age of 70.2 years (range, 51-85 years) and a mean prostate volume of 45.6 mL (range, 25.2-87.1 mL). Table 1 summarizes changes in subjective symptoms and objective findings. A significant decrease in IPSS was observed. After 12 weeks, the mean reduction in score was 4.8 points (26.3%). Significant decreases were also observed in IPSS sub-scores for voiding and storage, IPSS-QOL, OABSS, and BII. Although 48 patients (67.6%) fulfilled the criteria of OAB (total OABSS \geq 3 and urinary urgency \geq 1 per week) at baseline, the number of patients diagnosed as having OAB according to the diagnostic criteria of OABSS decreased to 27 (38.0%) 12 weeks after administration.

Concerning voiding function, Q_{max} increased, with a significant improvement after 12 weeks. An increase of 2.0 mL/sec (28.2%) was observed. P_{det}Q_{max} changed from 75.5 to 65.2 cmH₂O and decreased by 10.3 cmH₂O after 12 weeks. BOOI changed significantly from 61.3 to 47.1 (p = 0.004). At baseline, 58 patients (81.7%) had BOO (BOOI > 40), while the number of patients with BOO declined to 40 patients (56.3%) after 12 weeks, representing a substantial improvement. Regarding storage function, based on the UDS results, we observed a statistically significant improvement in mean MCC. Additionally, although DO was present in 38 (53.5%) patients prior to treatment, it disappeared in 15 of 38 patients (39.5%) after tadalafil administration (p = 0.008).

Table 1. Changes of subjective and objective parameters before and after administration

N=71	Baseline Mean±SD	12Wks Mean±SD	Difference in mean change	p Value
IPSS-total	18.2±6.1	13.4±7.0	-4.8	<0.001
IPSS-storage	7.5±3.0	5.5±3.0	-2.0	<0.001
IPSS-voiding	10.7±4.4	7.9±5.0	-2.8	<0.001
IPSS-QOL	4.9±0.9	3.2±1.5	-1.7	<0.001
OABSS-total	6.5±3.1	4.7±2.9	-1.8	<0.001
BII-total	7.4±2.8	4.7±3.4	-2.7	<0.001
FDV (mL)	132±61	152±59	+20	0.055
MCC (mL)	236±88	270±89	+34	0.030
pdetQmax (cmH₂O)	75.5±27.4	65.2±23.7	-10.3	0.018
Qmax (mL/sec)	7.1±3.5	9.1±3.6	+2.0	0.001
PVR (mL)	64±66	47±44	-17	0.079
BOOI	61.3±30.6	47.1±27.3	-14.2	0.004
Incidence of DO	38/71	23/71	Disappearing rate 39.5%	0.008

Concluding message

Twelve weeks' treatment with tadalafil significantly improved lower urinary tract functions, in terms of bladder capacity, DO, Qmax, and BOOI. Tadalafil effectively relieved LUTS by improving storage and voiding function as well as subjective symptoms in patients with LUTS/BPH.

References

1. Yokoyama O, Yoshida M, Kim SC, et al. Int J Urol. 2013; 20: 193-201
2. Dmochowski R, Roehrborn C, Klise S, et al. J Urol. 2010; 183: 1092-7.

Disclosures

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