Effect of Tamsulosin in Lower Urinary Tract Symptom Patients With Metabolic Syndrome

Hana Yoon, Hyun Suk Yoon, Yong Seong Lee, Sung Tae Cho, and Deok Hyun Han

OBJECTIVE To investigate the efficacy of tamsulosin, a selective alpha-1 blocker, in lower urinary tract symptoms (LUTS) patients with metabolic syndrome (MS).

PATIENTS AND METHODS This prospective, multicenter clinical trial included men and women (20-75 years old) with LUTS, with or without MS. Patients were categorized as MS+ or MS−, respectively, and all of them were administered tamsulosin 0.2 mg per oral once daily for 24 weeks. Patients were assessed based on the International Prostate Symptom Score, King's Health Questionnaire (KHQ), Overactive Bladder Questionnaire, uroflowmetry with postvoid residuals, and MS factors (blood pressure, waist-to-hip ratio, and serum levels of fasting blood glucose, triglyceride, and high-density lipoprotein cholesterol) at baseline and at 4, 12, and 24 weeks of treatment.

RESULTS Ninety-two patients were enrolled in this study (53/92 were MS− [57.6%]; 39/92 were MS+ [42.4%]). After 24 weeks of tamsulosin treatment, fasting blood glucose ($P = .02$) and triglyceride ($P < .001$) levels of changes were significantly greater in the MS+ group than in the MS− group. Total International Prostate Symptom Score, total Overactive Bladder Questionnaire score, and the scores of each question on the KHQ showed significant improvement after treatment without intergroup differences. In KHQ, although improvements in emotional status, sleep quality, fatigue, and personal distress were greater in the MS+ group ($P = .05$), the difference between the groups did not reach statistical significance.

CONCLUSION Tamsulosin was effective in both LUTS patients with and without MS. Furthermore, tamsulosin had beneficial effects on some of the factors associated with MS. UROLOGY 88: 135–142, 2016.

Metabolic syndrome (MS) is a complex disease associated with various chronic metabolic dysfunctions such as hypertension, hyperlipidemia, and diabetes.[1] Recently, the prevalence of MS in Korea has been rapidly increasing because of the aging population, excessive consumption of fast foods high in fats, and lack of dietary fiber.[2,3] The Korean National Health and Nutrition Examination Survey data revealed that the age-adjusted prevalence of MS increased significantly from 24.9% in 1998, 29.2% in 2001, and 30.4% in 2005 to 31.3% in 2007.3 MS affects not only the cardiovascular system but also the neurotransmitter system. Therefore, MS plays an important role in urologic diseases and is associated with comorbidities and risk factors.[4,5] Diabetes, hyperlipidemia, and other factors comprising MS may affect the neurovascular system, resulting in the development of lower urinary tract symptoms (LUTS).

Few studies have evaluated the association between risk factors of MS, benign prostatic hyperplasia (BPH), and LUTS; however, none has assessed treatment outcomes based on the presence or absence of those factors. Therefore, the aim of the present study was to investigate the efficacy of tamsulosin, a selective alpha-1 blocker, in LUTS patients with MS, and to investigate the changes in the MS factors over time with tamsulosin treatment.

PATIENTS AND METHODS

This study is a prospective, multi-institutional clinical trial. The clinical protocol had been reviewed and approved by the institutional ethical review board of each hospital. The inclusion criteria of this study were adult men and women

Financial Disclosure: *The authors declare that they have no relevant financial interests.*

Funding Support: *This study was supported by a program for clinical research grant (AKR-HA-2008-02) support from Astellas Pharma Korea Inc.*

From the Department of Urology, Ewha Womans University School of Medicine, Seoul, Republic of Korea; the Department of Urology, Hallym University College of Medicine, Seoul, Republic of Korea; and the Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Republic of Korea

Address correspondence to: Hana Yoon, M.D., Ph.D., Department of Urology, Ewha Womans University School of Medicine, Seoul, Republic of Korea. E-mail: wowhana@ewha.ac.kr

Submitted: March 31, 2015, accepted (with revisions): July 9, 2015

with LUTS aged 20 years or older with or without MS. Inclusion of LUTS were limited to LUTS-BPH in men and LUTS with functional bladder outlet obstruction (Q_{max} < 15 mL/second) in women.

MS was defined according to the National Cholesterol Education Program—Adult Treatment Panel III criteria (positive in at least 3 categories among the 5 profiles): hypertension (systolic blood pressure [BP] > 130 mmHg, diastolic blood pressure [DBP] > 85 mmHg), hyperglycemia (fasting blood sugar > 110 mg/dL), obesity (waist-to-hip ratio [WHR]: men, >0.9; women, >0.85), hypo–high-density lipoprotein cholesterol (HDL-C) (men, <40 mg/dL; women, <50 mg/dL), and hyper-TG (>150 mg/dL). If a patient had been taking medications for one of the above-mentioned criteria, the duration of administration should have been greater than 6 months, without any history of alpha-blocker treatment within the most recent 6 months. Patients who had started antihypertensive or antidiabetic medications within the most recent 6 months; those with confirmed congestive heart disease, multiple transient ischemic attacks, angina, treated heart failure, myocardial infarction within the previous 3 months or stroke in the previous year; and those who started medications for the treatment of diabetes mellitus, hypertension, or hyperlipidemia while taking tamsulosin were excluded from the study. Based on the presence or absence of MS, the patients were grouped as MS+ (LUTS with MS) or MS− (LUTS without MS). All patients were administered tamsulosin 0.2 mg orally once daily, which is the usual dose in Korea, for 24 weeks. Informed consent about their medications for LUTS, the purpose of the present study, and the schedule for assessment were approved from all of the enrolled patients. The patients also were informed not to change their usual habits including diet, exercise, and drugs that may have influenced the result of the present study during the study period but to continue what they have been consistently doing for the past 6 months. Subjective LUTS and related issues were objectively assessed based on the 3-day frequency-volume charts, International Prostate Symptom Score (IPSS), King's Health Questionnaire (KHQ), Overactive Bladder Questionnaire (OAB-Q), at baseline and at 4, 12, and 24 weeks of treatment. Each question consisting KHQ was grouped as A, B, C sections for statistical analysis: (A) first 12 questions about health status, effect of LUTS on daily life, and personal distress from LUTS; (B) next 9 questions about limitation of physical activity, personal role, social activity, and relationship; (C) last 10 questions about emotion, sleep, and etc.

Factors associated with MS, such as BP, WHR, fasting blood glucose (FBG), and serum triglyceride (TG) and high-density lipoprotein cholesterol (HDL-cholesterol) levels were also assessed at baseline and at 4, 12, and 24 weeks of treatment. In men, uroflowmetry, postvoid residuals, digital rectal examination, transrectal ultrasonography, and serum prostate-specific antigen level testing were performed to evaluate BPH and for prostate cancer screening before starting medical treatment. In women, besides symptom questionnaires and frequency-volume charts, uroflowmetry and postvoid residuals were checked to evaluate the presence of functional bladder outlet obstruction with OAB.

Data were compared and analyzed by the SPSS program version 12.0 for Windows (SPSS Inc., Chicago, IL), using chi-square test, Student's *t* test, and analysis of variance test. Analyses were compared according to the time frame within each group (P_{time}), the changes between the 2 groups (P_{group}), and the significance of interactions between the 2 groups (P_{int}). Statistical significance was set at a *P* value <.05.

RESULTS

The number of the patients who enrolled and successfully finished the current study was 92 with age range from 35 to 75 (median 61, mean 60.0 ± 9.0) years old (53/92 MS− patients [57.6%], mean age 60.1 ± 9.1 years; and 39/92 MS+ patients [42.4%], mean age 60.0 ± 9.0 years). There were no significant differences in the patients' characteristics between the 2 groups (MS− vs MS+), except for the presence of comorbidities (Table 1).

When comparing the mean height, weight, and other factors associated with MS, the WHR (*P* < .001) and the serum FBG (*P* = .02) and TG (*P* < .001) levels were significantly different between the 2 groups (Table 2).

Systolic BP and DBP showed significant changes in each group over time (*P* = .03 and *P* = .037, respectively). The WHR showed only intergroup difference between the MS− and MS+ groups without any significant changes over time (Table 3).

Table 1. Patient characteristics

		MS (–)		MS (+)		
Patients (Baseline)		n	%	n	%	*P* value*
Sex	Men	46	86.8	37	94.9	.293
	Women	7	13.2	2	5.1	
Past medical Hx	No	44	83.1	33	84.6	.253
	Yes	34	64.1	29	74.3	

MS, metabolic syndrome; past medical Hx, past medical history (any kind of medical diseases—diabetes mellitus, hypertension for more than 6 months, congestive heart disease, multiple transient ischemic attacks, angina, treated heart failure, myocardial infarction foe more than 3 months, or stroke longer than a year).
* Chi-square test.