

VOIDING SYMPTOMS AND STORAGE SYMPTOMS IN MALE PATIENTS WITH LUTS; WHICH SYMPTOMS ARE AGGRAVATED BY ATHEROSCLEROSIS?

Hypothesis / aims of study

Recent studies suggest that cardiovascular disease such as atherosclerosis causes lower urinary tract symptoms (LUTS)¹. One possible mechanism contributing to LUTS from atherosclerosis might be ischemia and oxidative stress of the urinary bladder. Masuda et al. have currently reported that oxidative stress mediates detrusor overactivity in rat bladder², concluding that atherosclerosis causes storage symptoms. Whereas several basic studies have demonstrated the influence of atherosclerosis on storage symptoms, there has been no clinical evidence showing the association between atherosclerosis and storage symptoms. The present study is thus aimed to identify the contribution of atherosclerosis to the voiding and storage symptoms in male patients with LUTS.

Study design, materials and methods

Male patients with LUTS, aged 50 or older, were examined with routine urological investigation including measurement of prostate volume. All patients were asked to complete the validated Japanese version of the IPSS. Mild to moderate male LUTS patients, whose total IPSS score was under 20, were enrolled in this study. As a screening for atherosclerosis, ultrasound examination of the carotid artery and pulse wave velocity (PWV) were carried out. A plaque score was defined by summation of the intima-media thickness (mm) at both left and right carotid artery by using a 11-MHz liner array transducer SSA-770A (TOSHIBA, Japan). Severity of atherosclerosis was graded according to the following guideline: normal (score 0), mild (score 1 to 5), moderate (score 5.1 to 10), and severe (score over 10). The PWV value was measured with BP203RPE (OMRON, Japan). The PWV value for a normal adult is 1400 cm/s, and higher PWV value means atherosclerosis of the peripheral arteries.

The voiding and storage IPSS sub-score (IPSS-V and IPSS-S, respectively) were recorded separately. According to their each IPSS sub-score, patients were divided into two groups, mild (score 0-5) group and moderate-severe group (score 6-15), respectively. The plaque score and PWV value were compared between the two groups.

Results

A total of 56 male patients (69.9 ± 9.7 y.o) entered the study.

Voiding symptoms and atherosclerosis:

The relationship between atherosclerosis and IPSS-V is shown in Table 1. There was no significant difference in age distribution between the two groups (mild IPSS-V group: 70.1 ± 9.8 y.o, moderate-severe IPSS-V group: 68.9 ± 6.1 y.o). Average prostate volume of moderate-severe IPSS-V group (31.4 ± 20.0 ml) was 1.5 times increased that of the mild IPSS-V group (23.8 ± 13.7 ml). Plaque score and PWV value were not significantly different between the two groups.

Storage symptoms and atherosclerosis:

Table 2 shows the relationship between IPSS-S and atherosclerosis. Average age of the two groups was not statistically different. Plaque score of the moderate-severe IPSS-S group was 8.24 ± 4.93 and significantly higher than that in the mild IPSS-V group (4.76 ± 3.36) (p=0.014). Moreover, PWV value of the moderate-severe IPSS-S group (1650 ± 282 cm/s) was also significantly higher than that of the mild IPSS-S group (1473 ± 216 cm/s)(p=0.023). Average prostate volume of the mild and moderate-severe IPSS-S group was 26.3 ± 15.8 ml and 21.3 ± 8.2 ml, respectively; not significantly different (p=0.793).

Interpretation of results

According to the severity of IPSS-S, both the plaque score and PWV value were significantly increased, while there was no relationship between the severity of IPSS-S and prostate volume. On the other hand, there was no difference in the plaque score and PWV value between the mild and moderate-severe IPSS-V groups. These findings indicate that atherosclerosis is strongly associated with the storage symptoms as compared to voiding symptoms in the male patients with LUTS.

Concluding message

Atherosclerotic condition would contribute to the development of storage symptoms in male patients with LUTS.

Table 1. Comparison of age, prostate volume and atherosclerosis parameters between the two groups divided by severity of voiding symptoms

IPSS-V	mild (score0-5) n=40	moderate-severe (score6-15) n=16	P value
age	70.1 ± 9.8	68.9 ± 6.1	0.592
prostate volume (ml)	23.8 ± 13.7	31.4 ± 20.0	0.186

plaque score	6.98 ± 4.60	5.49 ± 2.98	0.245
PWV (cm/s)	1582 ± 288	1478 ± 159	0.129

Table 2. Comparison of age, prostate volume and atherosclerosis parameters between the two groups divided by severity of storage symptoms

IPSS-S	mild (score0-5) n=24	moderate-severe (score6-15) n=32	P value
age	68.2 ± 8.0	72.1 ± 8.7	0.098
prostate volume (ml)	26.3 ± 15.8	21.3 ± 8.2	0.793
plaque score	4.76 ± 3.36	8.24 ± 4.93	0.014
PWV (cm/s)	1473 ± 216	1650 ± 282	0.023

References

1. Ponholzer A, Temml C, Wehrberger C, Marszalek M, Madersbacher S. The association between vascular risk factors and lower urinary tract symptoms in both sexes. *Eur Urol.* 2006 Sep;50(3):581-6.
2. Masuda H, Kihara K, Saito K, Matsuoka Y, Yoshida S, Chancellor MB, de Groat WC, Yoshimura N. Reactive oxygen species mediate detrusor overactivity via sensitization of afferent pathway in the bladder of anaesthetized rats. *BJU Int.* 2008 Mar;101(6):775-80.

Disclosures

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