

CHANGES OF URINARY NERVE GROWTH FACTOR AND PROSTAGLANDINS IN MALE PATIENTS WITH LOWER URINARY TRACT SYMPTOM

Aims of Study

Lower urinary tract symptom (LUTS) are highly prevalent in elderly men. Bladder outlet (BOO) is one of the principal causes of LUTS; in addition to BOO, detrusor factors such as detrusor overactivity and underactivity can contribute to the development of LUTS. Most of patients with LUTS have irritative or storage symptom such as frequency and urgency. Some of these effects may be due to alterations in the intrinsic properties of the bladder smooth muscle and others may be related to changes in the neural control of the bladder. Nerve growth factor (NGF) is a secretory protein which plays a critical role in the development of the peripheral nervous system. Increased expression of the NGF in the urinary bladder may contribute to irritative symptoms in patients with LUTS. Prostaglandin (PG) affect the micturition reflex and the bladder is a site of PG synthesis. Therefore, NGF and PGs can be related to irritative or storage symptom in patients with LUTS. This study was performed to investigate the changes in urinary NGF and PGs in male patients with LUTS.

Methods

The study groups included 75 male patients with LUTS (mean age 62.5) and 20 patients without LUTS (mean age 56.8) as reference control. The evaluation included history taking, urinalysis, international prostatic symptom score (IPSS), and urodynamic study. Voided urine was collected in all patients. The urinary NGF, PGE₂, PGF_{2 α} and PGI₂ concentration was analysed by using an enzyme linked immunosorbent assay and these results were compared with the control group. Also, urinary NGF and PGs concentration was correlated with IPSS score (obstructive and irritative) and urodynamic parameters (first voiding sense, maximal bladder capacity, presence of detrusor overactivity and underactivity, and presence of BOO) in LUTS patients.

Results

From the analysis of the IPSS, the obstructive and irritative symptom scores were increased in LUTS patients. The urodynamic study in LUTS patients showed that more than half of the patients had detrusor overactivity (51%) and BOO (53%). The incidence of underactivity was noted in 7 patients (9%) in LUTS patients. The urinary concentration of NGF and PGE₂ were significantly increased in patients with LUTS compared with control ($p < 0.05$). However, the concentration of PGF_{2 α} and PGI₂ were not significantly different between LUTS and control patients. In LUTS patients, the concentration of PGE₂ was decreased in patients with underactivity compared with patients without underactivity ($p < 0.05$). Furthermore, the concentration PGE₂ was negative correlated with maximal bladder capacity in LUTS patients ($p < 0.05$). The urinary NGF, PGF_{2 α} , and PGI₂ were not correlated with IPSS score and urodynamic parameters in LUTS patients.

Conclusions

This study has demonstrated that the NGF and PGE₂ have important role in male patients with LUTS, and PGE₂ can change according to detrusor function. Also, these changes can be confirmed with analysis of urine. Therefore, these results may be used as urinary markers to evaluate the detrusor dysfunction in LUTS patients.