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EXTRACT OF PEUCEDANUM JAPONICUM, AN UMBELLIFERAE PLANT, ALLEVIATED ACETIC ACID-INDUCED HYPERTENSIVE BLADDER RESPONSE IN RATS

Hypothesis / aims of study

Phytotherapeutic agents are very popular in many European countries as herbal remedies represent up to 80% of all drugs prescribed for these disorders.[1] Debruyne et al[2] reported that Permixon® (lipid-sterolic extract of SPE) and □$_1$-blocker are equivalent in the medical treatment of lower urinary tract symptoms in men with BPH over 12 months. *Peucedanum Japonicum* (PJ) is one of umbelliferae plants, inhabited at southern parts of Japan such as Kyusyu island, Yakushima and Okinawa. We showed previously that the extract of PJ and its pharmacologically active constituent (isosamidin) exerted a significant relaxant effect of rat isolated arterial strip and a concentration-dependent inhibition of agonists-stimulated contraction of isolated strips of rabbit prostate and bladder (Fig. 1).[3] These results led us to the assumption of improvement by PJ extract of lower urinary tract symptoms such as overactive bladder. Therefore, the aim of this study is to clarify the effect of PJ extract on urodynamic functions in anesthetized rat cystometry. Furthermore, the binding activity of PJ extract on muscarinic and □$_1$-adrenergic receptors was examined.

Study design, materials and methods

The effect of single oral administration of PJ extract (10 mg/kg) was examined on urodynamic parameters in cystometrograms of anesthetized rats induced by intravesical infusion of 0.1% acetic acid. The autonomic (muscarinic and □$_1$-adrenergic) receptor binding activity of PJ extract in the rat tissue was examined by radioligand binding assay using [^{3}H]*N*-methylscopolamine (NMS) and [^{3}H]prazosin as selective radioligands of muscarinic and □$_1$-adrenergic receptors.

Results

Single oral administration of PJ extract (10 mg/kg) in 0.1% acetic acid-infused rat cystometry caused an increase in the micturition interval and a significant decrease of micturition frequency during the intravesical infusion of 0.1% acetic acid (Fig. 2). The PJ extract had little effect on the maximum micturition pressure, threshold pressure and voided volume in rats and decreased the basal pressure. PJ extract had little effect on the muscarinic and □$_1$-adrenergic receptor binding activity in rat tissues, evaluated by radioligand binding assays using [^{3}H]NMS and [^{3}H]prazosin.

Interpretation of results

Single oral administration of PJ extract alleviated significantly urodynamic symptoms in hyperactive rat bladders by prolonging the micturition interval and decreasing micturition frequency. Although the precise mechanism which PJ extract improved a hyperactive bladder response in acetic acid-infused rats remains to be clarified, the relaxant effect of smooth muscle in the bladder and prostate may be partly contribute to the beneficial effect.

Concluding message

PJ extract improved significantly urodynamic symptoms in hyperactive rat bladders by decreasing the micturition frequency. Thus, the current results may support the clinical efficacy of PJ extract in the treatment of lower urinary tract symptoms accompanying overactive bladder.

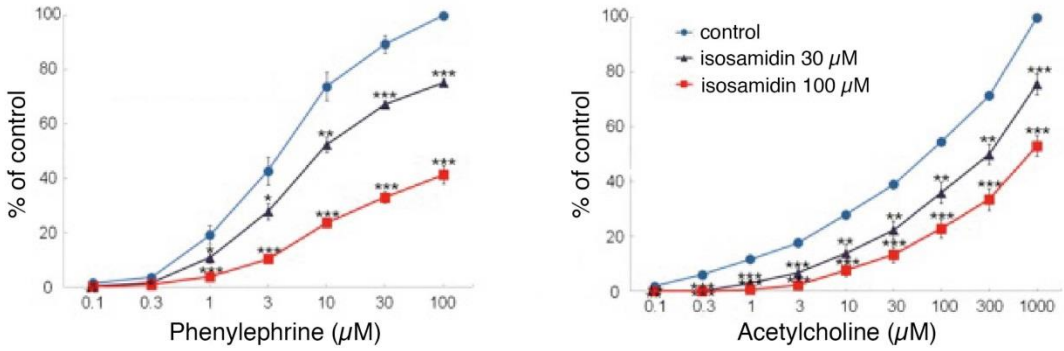

Fig. 1. Inhibitory effect of isosamidin (30, 100 □M) on the agonists (phenylephrine, acetylcholine)-stimulated contraction of isolated strips of rabbit prostate (left) and bladder (right)

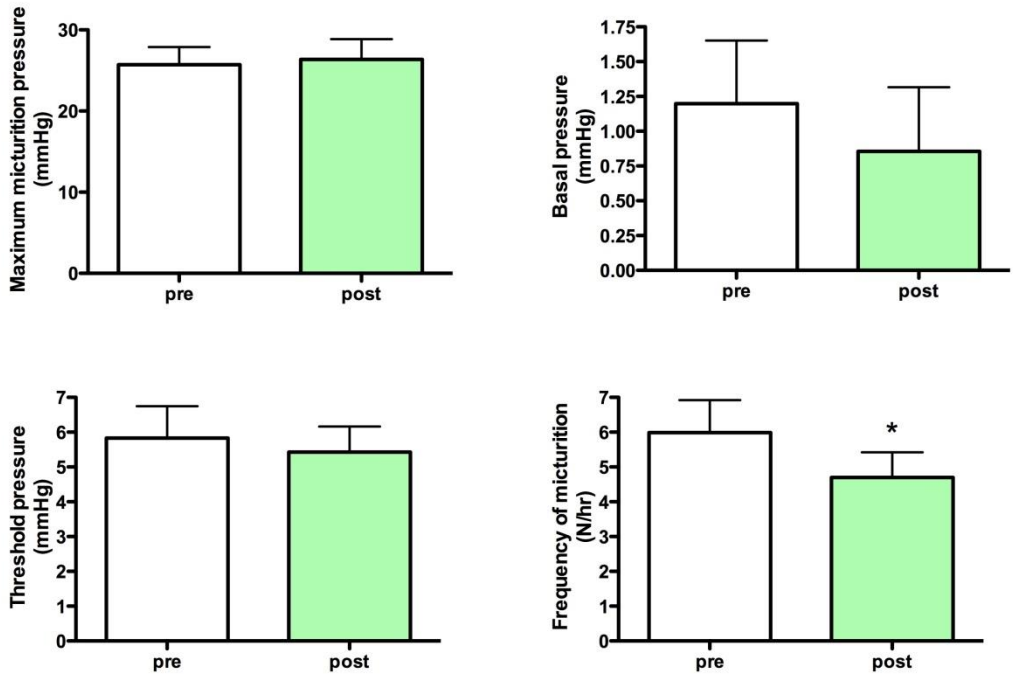

Fig. 2. Effects of oral administration of PJ extract on the maximum micturition pressure, micturition interval, basal pressure, frequency of micturition, threshold pressure and voided volume in rats infused continuously 0.1% acetic acid.

References
1. Br J Urol, 78: 325 (1996)
2. Eur Urol, 41: 497 (2002)
3. The 19th Annual meeting of the Japanese Neurogenic Bladder Society (2012)

Disclosures
Funding: No **Clinical Trial:** No **Subjects:** ANIMAL **Species:** Rat **Ethics Committee:** The guidelines for the care and use of laboratory animals of the University of Shizuoka.