460

Honjo H[1], Ukimura O[2], Ushijima S[2], Suzuki K[2], Inaba M[2], Iwata T[2], Kitakoji H[3], Miki T[2]
1. Department of Urology, Kyoto Prefectural University of Medicine and Meiji Univ. of Oriental Med., 2. Department of Urology, Kyoto Prefectural University of Medicine, 3. Meiji University of Oriental Medicine

SELECTION OF CANDIDATE FOR ACUPUNCTURE-TREATMENT OF URINARY INCONTINENCE DETERMINED BY NEUROMETER TO MEASURE CURRENT PERCEPTION THRESHOLD IN THE BLADDER

Aims of Study

The Neurometer devices are reported to assess independently the functional integrity of the large myelinated (Aβ), small myelinated (Aδ) and unmyelinated (C) sensory nerve fibers at any cutaneous site (1). Recently we first applied this device for the human bladder (2). We reported that quantitative selective measurement of the current perception threshold (CPT) values of the bladder afferent fibers could be successfully assessed in hyper-sensitive and hypo-sensitive dysfunction using an intravesical electrode on the human bladder wall (2). Additionally, intravesical resiniferatoxin has improved the clinical symptom of reflex incontinence in a patient with detrusor hyperreflexia, accompanied with increase of bladder capacity as well as a change from hyper- to hypo-sensitivity of C-fiber determined by neurometer (3). In our previous study, we have reported the clinical usefulness of acupuncture for the treatment of urinary incontinence caused by detrusor hyperreflexia in patients with neurological diseases (4, 5). Then, we hypothesized that the mechanism of acupuncture to improve detrusor hyperreflexia might involve the inhibition of hyper-sensitivity of C-fiber. The aim of this study is to investigate the effects of acupuncture to C-fiber sensitivity in the patients with urge urinary incontinence.

Methods

A total of 6 patients with urge urinary incontinence were treated by acupuncture. All patients were determined hyper-sensitivity by measurement of the CPT values in the bladder, compared to control values as reported previously (2, 3). CPT values were measured using a Neurometer (Neuroton, Baltimore, MD), which emits graded alternating current stimuli at 2000, 250, and 5 Hz at digitally calibrated levels from 0 to 10 mA. CPT values at frequencies of 2000, 250, and 5Hz were determined on the bladder wall using an intravesical electrophysiological catheter (5 French size, fixed curve, Cordis Webster Inc, Baldwin Park, CA). At each frequency the current was increased until the patient could perceive a sensation. Measurement of the minimum threshold for perception was performed at least three points, of which the average was determined as the CPT value in the bladder.

Acupuncture was performed using disposable stainless steel needles (0.3 mm in diameter, 60 mm in length, SEIRIN Kasei, Shimizu, Japan) with the patient in the prone position. Acupuncture needles were inserted into the bilateral BL-33 (Zhongliao) points as standardized by the World Health Organization, on the skin of the third posterior sacral foramina. A needle was inserted into each side of the foramina sufficiently deeply for its tip to be placed close to the sacral periosteum, and then the bilateral needles were rotated reciprocally with manual change of rotary direction for 10 min. The treatment was repeated once a week for 4 weeks for the initial treatment (1st to 4th acupuncture).

Urodynamic study was performed, using Menuet Compact (Dantec, Skovolunde, Denmark), with the patient in the supine position before acupuncture and one week after the 4th acupuncture as well as to monitoring measurement of the CPT values in the bladder. Cystometry was undergone with an 8F catheter inserted through the urethra, using sterile saline at a filling rate of 50 ml/min. Bladder capacity was defined as the volume until strong desire to void or involuntary detrusor contraction was recognized. All patients recorded a bladder diary for 1 week before treatment as a baseline, and again after the 4th acupuncture. The therapeutic effect of the acupuncture was evaluated based on changes in volume of urinary urge incontinence recorded in the bladder diary.

Results

Improvement of clinical symptom was found in five (83%) out of the 6 patients. Incontinence completely disappeared in three, and it decreased to less than 50% of baseline in two patients. The mean CPT values of C-fiber, determined by neurometer, significantly changed from the baseline value of 4.4±2.2 to 17.4±11.0 in one week after 4th acupuncture ($p<0.05$). Mean of the bladder capacity increased from 121.3±50.1 ml to 225.8±86.9 ml ($p<0.05$). No side effects were recognized throughout the treatment period. In a non-responder, in which reason of failure is unknown, or may be due to technical incompleteness of acupuncture, only a little change of the CPT values was demonstrated from 3.8 to 6, with a little change in the bladder capacity from 170 ml to 185 ml.

Conclusions

Acupuncture has improved the clinical symptom of urge urinary incontinence, accompanied with increase of bladder capacity as well as inhibition of hyper-sensitivity of C-fiber determined by neurometer. Neurometer has a potential to select appropriate candidate for effective treatment in individual patient. This study suggested that, especially in patients with urinary incontinence that is thought to be caused by hyper-sensitivity of C-fiber, acupuncture is a promising therapeutic alternative.

References

1 Arch Phys Med Rehabil 68: 210-213, 1987
2 Neurol Urodyn 20: 573-574, 2001
3 Neurol Urodyn 20: 333-334, 2002
4 Urol Int 65: 190-195, 2000
5 32th ICS Proceedings: 219-220, 2002