

A POSITIVE ICE WATER TEST IS ASSOCIATED WITH HIGH GRADE BLADDER OUTLET OBSTRUCTION IN MEN WITH BENIGN PROSTATE HYPERPLASIA

Aims of Study

A variety of symptoms other than reduced flow itself due to bladder outlet obstruction (BOO) annoy patients with benign prostatic hyperplasia (BPH). It is reported that 45 to 80% of patients with BPH have detrusor overactivity (DO), more closely associated with increased daytime-frequency and urgency of urination than obstructive symptoms.

C-fibers, which are primitive afferent sensory nerves derived from nociceptors and capable of responding to thermal or pain stimulation, may contribute to the micturition reflex in patients with suprasacral upper motor neuron lesions. It has been demonstrated that re-activation of dormant C-fibers by BOO yields DO in an animal experimental model. Increased levels of nerve growth factor (NGF) have been reported in human bladder tissue with obstruction. Fibers of A δ - as well as C- type, both afferent nerves, are stimulated by NGF exposure . Therefore, it is likely that new formation or re-activation of a reflex loop via C-fibers may occur in patients with BPH.

The ice water test (IWT) taking advantage of the bladder-cooling reflex (BCR) is available as a speedy and simple method for detecting C-fiber re-activation.

In the present study, we examined responses to IWT in neurologically normal patients with BPH and assessed the results with reference to urodynamic data and clinical characteristics.

To detect detrusor overactivity possibly due to C-fiber activation, we examined responses to the ice water test (IWT) in patients with benign prostatic hyperplasia and assessed the results with reference to urodynamics, clinical symptoms and quality of life.

Methods

One-hundred forty-seven patients (20 patients with and, 127 without neurological disease) who were more than 50-years of age, with International Prostate Symptom Scores >8 points, and with a Quality of Life index >2 points were enrolled. We tested response to ice water instillation by monitoring the intravesical pressure in all cases and assessed the results with reference to findings of IPSS and QOL index questionnaires, bladder outlet obstruction indices, 48-hour frequency volume charts, prostate volume, and data from free flowmetry and pressure flow studies (PFS) for detecting detrusor overactivity.

Results

Responders to IWT accounted for 14(70%) of patients with neurological disease, while 35(27%) of patients without neurological disease, all of whom showed detrusor overactivity in PFS. The population of neurologically normal patients with BPH was divided into 3 groups: DO-positive IWT-responders (A); DO-positive IWT-non-responders (B); and DO-negative IWT-non-responders (C) in evaluating the results based on the response pattern for DO and IWT. Patients responding to IWT had higher bladder outlet obstruction indices than non-responders (A: B: C; 68: 52: 34, A vs. C: $p<0.0001$ A vs. B: $p=0.037$) whereas they had a smaller volume at maximum cystometric volume (A: B: C; 233: 266: 321; A vs. C: $p<0.0001$ A vs. B: $p=0.004$). The Maximum voided volume recorded from 48-hour frequency volume charts was also smaller for responders than non-responders (A: B: C; 200: 263: 319, A vs. C: $p<0.0001$ A vs. B: $p=0.012$).

Conclusions

Patients with BPH clearly show detrusor overactivity that is due to active C-fibers stimulated by bladder outlet obstruction and is a cause of decreased bladder capacity. We need to assess the reversibility of C-fiber activation following surgical treatment for BPH and clarify criteria for decision-making with the aid of IWT.