

URGENCY TIP ; A PORTABLE PATIENT-ACTIVATED DEVICE FOR OBJECTIVE MEASUREMENT OF BLADDER SENSATION.

Hypothesis / aims of study

Urgency is the key symptom of the overactive bladder (OAB). Indeed, it is the only symptom that the patient must have to be described as having OAB. In 2002 the ICS formulated a consensus definition of OAB as urgency with or without urgency urinary incontinence, usually with frequency and nocturia, in the absence of local pathological or endocrine factors. However, the objective measurement of urgency is difficult in most cases, especially elderly. Several institutes have already created a keypad for urgency which is usually used in mainly with a urodynamic testing. We developed a portable device for recording the bladder sensation anywhere and any time during everyday life.

Study design, materials and methods

We employed a following scale for grading bladder sensation and urgency. Grade1: Normal desire to pass urine (no urgency); Grade2: Slight urgency, but urgency passed away soon; Grade3: Moderate urgency, but urgency passed away while bearing; Grade4: Strong urgency, but managed to get to bathroom, and did not leak urine; Grade5: Strong urgency and could not get to bathroom in time, so leaked urine. 'Urgency Tip' is pocket-sized (6.3cm×9.3cm×0.8cm) and light (only about 35 gm in weight), and has five grading buttons and another button for cancellation available for 30 sec after switching a wrong grading button (Fig. 1). The grade and the time and date when the button was pushed are recorded and over 3000 events for 1 month can be memorized. The data can be easily transferred into personal computer for off-line analysis with the use of a convenient software (ex., Excel). 'UrgencyTip' were given 20 OAB patients and 7 controls. All devices were returned within a week.



Fig. 1

Results

The data were recorded correctly almost every day including working days. The patients with OAB showed significant higher values in average grade (2.40 vs 1.08, $p < 0.001$) and summed grade (26.49 vs 6.71, $p < 0.001$) in a day than controls did. The average times of pressing the button in a day are 10.90 (OAB patients) and 6.14 (controls), respectively ($p < 0.001$). A typical case of concurrent recording with frequency-volume chart (FVC) showed that high grade button was always pressed with voiding at bathroom.

Interpretation of results

To our knowledge, this is the first report of a cordless and portable device for objective measurement of bladder sensation. By using this device, we confirmed the key symptom, urgency, that is necessary and fundamental for the diagnosis of OAB. The summed score in OAB group was much higher than control people. The averaged score was

also significantly higher in OAB patients, which means the OAB patient generally feels stronger sensation of urine than normal people. This device showed the advantage of being able to quantify the degree of sensation of urine. Thus OAB can probably be divided into different grades according to the score, although its necessity and feasibility still need to be investigated by further works. The average times of pressing the tips were higher in OAB patients than normal people. This parameter is surely higher than the times really going to the bathroom, especially in OAB patients. However, it does represent the existence of urinary frequency to a certain degree. Sometimes patients are reluctant to perform FVC examination. The urgency tip provides an easy and less troublesome way to evaluate the urinary frequency and urgency.

Concluding message

This device proved to be easy for patient to record their bladder sensation. 'Urgency Tip' may be useful in both clinical practice and research to assess OAB and treatment effectiveness. A concurrent recording with FVC may clarify the relation between voided volume (including no voiding with bladder sensation) and bladder sensation.

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HUMAN SUBJECTS: This study was approved by the The ethics committee in university of yamanashi and followed the Declaration of Helsinki Informed consent was obtained from the patients.