

USEFULNESS OF ICE WATER TEST (IWT) TO UNMASK DETRUSOR OVERACTIVITY (DO)

Hypothesis / aims of study

Ice Water Test (IWT) is 56 years old. Initially, its interest was to discriminate between upper (UMN) and lower motoneuron (LMN) lesions in patients with neurogenic urinary symptoms (1). Since years, it has been demonstrated that IWT was positive in various clinical conditions (2). Today, IWT is usually performed to unmask detrusor overactivity (DO) when conventional cystomanometry (CCMM) is unable to give a reliable conclusion about the detrusor behavior. Our purpose was to retrospectively analyze IWT in patients whom CCMM was not contributory to assess detrusor behavior.

Study design, materials and methods

One hundred and twenty five patients whom complaint was suggestive of overactive bladder (OAB) syndrome and whom detrusor function was identified as normal, unspecified or underactive during CCMM (with saline at room temperature filling rate 50 ml/min) underwent a IWT to search for unmasked DO.

IWT was performed after CCMM. Starting from bladder empty, 250 ml of saline at $\leq 4^{\circ}\text{C}$ were instilled at 100 mL/min. Filling was followed by a waiting time of 1 min. Pressures and flow rate were recorded during filling and waiting time.

IWT was defined as positive if a non inhibited detrusor contraction (NIDC) $\geq 15 \text{ cmH}_2\text{O}$ with leakage occurring within 3.5 min (filling plus waiting time) (fig) intermediate in case of NIDC without leakage and negative in case of absence of any detrusor contraction.

Results

The population was consisted of 92 women ($58.5 \pm 17.3 \text{ y}$) and 33 men ($56.5 \pm 14.2 \text{ y}$).

Main complaints were mixed or urge incontinence (48/125) and chronic retention (47/125).

Eighty seven patients (58 women, 29 men) had an history of neurological disease.

From CCMM, detrusor behavior was founded normal for 40 patients, unspecified for 68 and underactive for 17.

IWT was positive for 16 patients. Fourteen had neurological condition : thirteen related to UMN lesions [7 encephalic, 3 Multiple Sclerosis (MS), 3 spinal cord injury (SCI)]; and 1 had diabetes mellitus. IWT was positive for 2 patients without any history of neurological disease (1 with urethral obstruction due to benign prostatic enlargement and 1 with OAB syndrome).

IWT was intermediate for 7 patients: 5 with UMN lesions (1 encephalic, 2 MS and 2 SCI), 1 with LMN (SCI) and 1 with a genital prolapse.

IWT was negative for 102 patients.

Interpretation of results

Techniques, indications and explanations for IWT had changed several times since the first description in 1957. Discordance between the results can be due to bad defined protocol. Temperature of ice water and filling rate have to be precised. Colder the water and higher filling rate are better and franker response of IWT is (3). Our IWT protocol has been built according with these conditions.

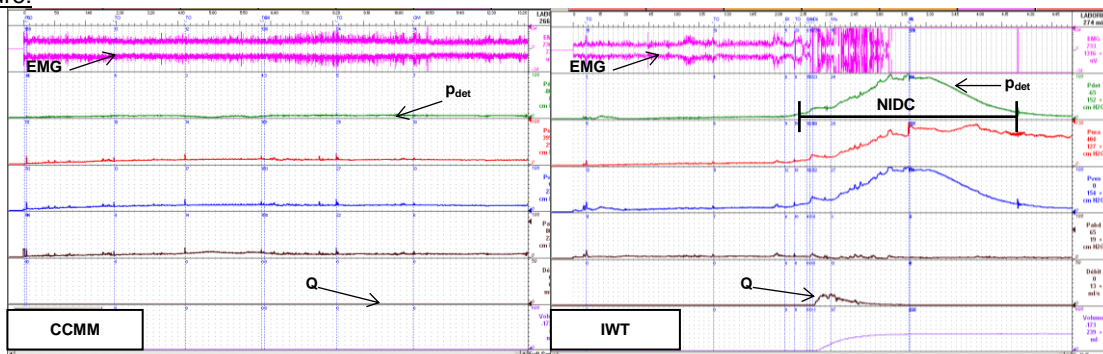
The physiopathology of the IWT is better known. IWT results from a lower motoneuron segmental reflex involving C-non myelinated fibers afferents. Specific temperature sensitive receptor, TRPM8, was discovered in 2002.

A strict protocol has been applied in that study to perform IWT. In that condition, IWT is able to unmask DO when CCMM is not contributory to assess the detrusor behavior while patient had OAB syndrome. IWT has not to be performed routinely. The history, clinical condition, complaints have to be well analyzed before doing IWT. In our results, we unmask 23/125 (18.4%) DO.

Concluding message

IWT allows unmasking DO in patients with history of neurological disease whose CCMM gave no reliable conclusion on the detrusor behavior. IWT is simple, not time and money consuming and easy to perform. Thus, IWT appears as a valuable complement of urodynamics and must be performed when the CCMM of a patient complaining of urgency leads to an ambiguous conclusion. A prospective study is necessary to confirm this filling.

Figure:



References

1. 1- Geirsson G, Lindstrom S and Fall M. The bladder cooling reflex and the use of cooling as stimulus to the lower urinary tract. J Urol 1999; 162: 1890-6.
2. 2- Al Hayek S, Abrams P. The 50-year history of the ice water test in urology. J Urol 2010; 183:1686-92.
3. 3- Geirsson G, Lindstrom S and Fall M. Pressure, volume and infusion speed criteria for the icewater test. Br J Urol 1994; 73: 498.

Disclosures

Funding: none **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** it involved retrospective analysis of urodynamic studies from a database **Helsinki:** Yes **Informed Consent:** No