

## DETRUSOR OVERACTIVITY: DO THE DIFFERENT PATTERNS HAVE CHARACTERISTICS RELATED TO GENDER OR CLINICAL CONDITION?

### Hypothesis / aims of study

Two patterns of detrusor overactivity (DO) are defined: phasic (PDO) and terminal (TDO) [1]. These patterns are observed in idiopathic (IPDO and ITDO) and neurogenic (NPDO and NTDO) DO. Are there differences in pattern and urodynamic characteristics according to age, gender, complaint and neurological status? In that last condition, are there differences according to the level of neurological injury?

### Study design, materials and methods

Retrospectively, 203 files of patients with proven urodynamic DO have been analyzed (127 women and 76 men, respectively 48 and 43 had neurological disease). Each gender was separately analyzed. Exclusion criteria were pelvic organ prolapse of grade  $\geq 2$ , complete spinal cord injury, diabetes mellitus, and anticholinergic treatment.

Studied parameters were pattern of DO and urodynamic characteristics of non-inhibited detrusor contraction (NIDC).

### Results

#### **1- Clinical condition**

There was no significant difference in the occurrence of a pattern of DO with the main complaint or the neurological status whatever the gender.

In NDO patients, NIDC#1 (PDO) occurred at lower bladder volume than TDO NIDC in patients with encephalic lesion ( $166 \pm 127$  vs.  $253 \pm 166$  mL;  $p = .0461$ ) while TDO NIDC occurred at lower bladder volume than PDO NIDC#1 in patients with medullar lesion ( $177 \pm 121$  vs.  $224 \pm 128$  mL; n.s.).

#### **2- Significant differences between patterns according with gender**

PDO patients were significantly younger in the whole population ( $56 \pm 19$  vs.  $66 \pm 4$  y;  $p < .0001$ ) and whatever gender ( $56 \pm 19$  vs.  $65 \pm 15$  y for women,  $p = .0052$  and  $57 \pm 18$  vs.  $68 \pm 12$  for men,  $p = .0038$ ).

The volume at onset of NIDC was significantly greater in women with ITDO vs. NTDO ( $274 \pm 126$  mL vs.  $154 \pm 90$  mL,  $p < .0001$ ).

#### **3- Urodynamic characteristics of DO in both genders**

In PDO, there was a significant increase of amplitude between the first and the last NIDC whatever the neurological status. For females: NPDO:  $15.5 \pm 11.9$  cm H<sub>2</sub>O vs.  $25.1 \pm 22.1$  cm H<sub>2</sub>O  $p = .0095$ ; IPDO:  $13.1 \pm 10.7$  cm H<sub>2</sub>O vs.  $27.8 \pm 21.5$  cm H<sub>2</sub>O  $p < .0001$ . For males: NPDO:  $22.1 \pm 18.8$  cm H<sub>2</sub>O vs.  $43.1 \pm 27.0$  cm H<sub>2</sub>O  $p = .0250$ ; IPDO:  $14.7 \pm 13.0$  cm H<sub>2</sub>O vs.  $46.0 \pm 40.9$  cm H<sub>2</sub>O  $p = .0211$ .

In TDO, amplitude of NIDC was significantly greater than that of NIDC#1 during PDO whatever the neurological condition. For women: NDO  $48.7 \pm 36.2$  cm H<sub>2</sub>O vs.  $15.5 \pm 11.9$  cm H<sub>2</sub>O ( $p < .0001$ ) and for IDO  $41.5 \pm 22.0$  cm H<sub>2</sub>O vs.  $11.5 \pm 9.6$  cm H<sub>2</sub>O ( $p < .0001$ ). For men: NDO  $57.3 \pm 30.5$  cm H<sub>2</sub>O vs.  $22.1 \pm 18.8$  cm H<sub>2</sub>O ( $p = .0002$ ) and for IDO  $65.8 \pm 39.8$  cm H<sub>2</sub>O vs.  $14.7 \pm 13.0$  cm H<sub>2</sub>O ( $p < .0001$ ).

#### **4- Differences in patterns according with gender**

For women, occurrence of a NIDC at cystometric capacity in PDO was more frequent in older ( $60.3 \pm 18.3$ y vs.  $47.4 \pm 19.3$ y,  $p = .0103$ ). NIDC#1 occurred at significantly smaller volume in IPDO ( $125 \pm 89$  vs.  $185 \pm 116$  mL,  $p = .0223$ ) while in ITDO NIDC occurred at larger volume ( $274 \pm 126$  vs.  $153 \pm 90$  mL,  $p = .0001$ ). No difference in men

For men: According with A-G number criterion, 30 men were found obstructed from which 9 had PDO and 21 TDO. No difference in patterns for equivocal and non-obstructed

#### **5- No difference in PDO according with gender**

There was neither difference in characteristics of NIDC #1: volume of occurrence ( $148 \pm 103$  vs.  $186 \pm 122$  mL), amplitude which was nearly significant ( $13.1 \pm 10.7$  vs.  $18.5 \pm 16.4$  cmH<sub>2</sub>O;  $p = .0535$ ), rise time ( $7.7 \pm 3.2$  vs.  $8.8 \pm 5.1$ s), nor in number of NIDC ( $3.2 \pm 1.7$  vs.  $3.8 \pm 3.1$ ).

### Interpretation of results

Urodynamic distinctions between IDO and NDO have been scarcely studied and only in women; to our knowledge urodynamic distinctions between the 2 patterns of DO (phasic and terminal) have never been studied.

We add two new contributions since we compare urodynamic data of DO patients of both genders according with the two patterns of DO.

An important result is that there are some similarities between the expression of PDO in both genders whatever the neurological condition.

Influence of age is observed in both genders, PDO occurs in younger individuals. That result is consistent with previous results [2]. In our study, women with NDO (P or T) are younger than women with IDO; men with NDO are also younger but not significantly.

Occurrence of a NIDC at cystometric capacity does not depend on the neurological status but is more frequent in older.

While our sub-groups have not a sufficient size, we give a first approach on the incidence of the level of neurological lesion on the expression of DO.

### Concluding message

The only difference between the patterns of DO is that DOP occurs in younger individuals. Except an expected higher detrusor pressure during the last NIDC in men with DOP, there is no significant difference between characteristics of each pattern whatever gender, complaint and neurological status.

Further studies will provide additional information on the impact of the neurologic lesion and bladder outlet obstruction on the pattern of DO.

### References

- 1- Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, van Kerrebroeck P, Victor A, Wein A. The standardisation of terminology of lower urinary tract function: Report from the standardisation sub-committee of the International Continence Society. NAU 2002; 21: 167-178
- 2- Valentini FA, Marti BG, Robain G, Nelson PP. Phasic or terminal detrusor overactivity in women: age, neurological condition, urodynamic findings and sphincter behaviour relationships. Int Braz J Urol 2011 ; 37 : 773-780

### 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