

## DETRUSOR OVERACTIVITY INHIBITION IN RESPONSE TO PELVIC FLOOR MUSCLE CONTRACTION.

### Hypothesis / aims of study

Multiple Sclerosis (MS) is a chronic neurologic disease involving the white matter pathways in the brain and spinal cord. Lower urinary tract dysfunctions (LUTD) are highly prevalent, affecting around 50 to 90% of these patients throughout the course of the disease. About 70% of MS patients that complain about lower urinary tract symptoms present detrusor overactivity (DO) during urodynamic study.

Previous studies demonstrated that pelvic floor muscle (PFM) contraction can decrease or suppress DO in overactive bladder patients, but no study have investigated if this decrease or suppression is also present in patients with MS. For this reason, the aim of the present study is to evaluate the detrusor overactivity inhibition in response to PFM contraction in women with MS, and its relationship with the functioning of PFM.

### Study design, materials and methods

Thirty three women of 18 years of age or older with a definitive diagnosis of MS, who had the relapsing-remitting form of MS but who have been stable over the previous 4 months, EDSS score less than 6,5, adequate cognitive capacity to complete the assessment, able to contract their PFM (grade 1 or more in Oxford scale) and reporting lower urinary tract symptoms (a score of nine or more on the overactive bladder questionnaire – OAB-V8) were invited to participate of this study. Potential participants were excluded if they were pregnant, had previous gynaecologic surgery, had a caesarean section or vaginal delivery within previous 6 months, pelvic organ prolapse (POP) greater than stage I on POP-Q examination.

All patients underwent urodynamic evaluation following the International Continence Society (ICS) recommendations and surface electromyography was performed during the evaluation. A bipolar pair of self adhesive surface electrodes was placed at the 3 and 9 o'clock positions around the anus (over the external anal sphincter muscle) and was coupled to electromyography amplifiers (bandwidth 20Hz to 450 Hz). Electromyographic data was sampled at 2000Hz and stored on a personal computer simultaneously with the urodynamic data. Those patients who presented a DO were asked to perform a PFM contraction to evaluate if this contraction is able to decrease or suppress DO. The electromyographic data was coded dichotomously as the presence or absence of decrease or suppress DO by PFM contraction. If the patient presented more than one DO the best result was considered.

Vaginal evaluation was performed according the PERFECT scheme with patients in a supine position with bent knees and legs abducted. In this study only the P and E domains were used and correlated with the electromyography results.

### Results

Thirty patients presented DO, seven patients (23,33%) suppresses DO and twenty (66,66%) patients decreased the amplitude of DO during a PFM contraction.

In the P domain of PERFECT scheme the greater score found was 3. Four patients showed a P of 1, thirteen a P of 2 and thirteen a P of 3, for this reason patients were divided in two groups: Group P1,2 (P 1,2) and Group P3 (P3). In the E domain the greater score was 7 seconds. Three women presented a E of 1, eight a E of 2, seven a E of 3, five a E of 4, three a E of 5, three a E of 6 and one a E of 7. In the same way, patients were divided in two groups: Group E 1,2 (E1,2) and Group E 3,4,5,6,7 ( E 3,4,5,6,7).

To investigate the relationship between the P and E with the decrease or suppress of DO the Fisher's exact test was used. P was statistically significant with the decrease ( $p = 0,001$ ) and suppress ( $p = 0,009$ ) of DO. E was statistically significant with the decrease ( $p = 0,01$ ) of DO.

### Interpretation of results

The mechanism of action of detrusor suppression upon PFM contraction needs to be clarified. It is assumed that squeezing the PFM induces a strong afferent discharge in the pudendal nerve branches which causes detrusor inhibition by activating the vesical sympathetic outflow and by inhibiting the pelvic nerve afferents in the sacral cord, declining DO.

These results explain why MS patients improve their lower urinary tract symptoms after a PFM training program, as previous studies. With a stronger and resistant PFM the patient can postpone voiding, manage urinary urgency and gain enough time to reach the toilet and prevent urge incontinence.

### Concluding message

The current study demonstrated that the most part of MS patients presented a suppression or decrease of DO when contracted their PFM and that this result is related with PFM strength and resistance.

### References

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Disclosures

**Funding:** FAPESP **Clinical Trial:** Yes **Public Registry:** Yes **Registration Number:** Sisnep nº 0886.0.146.000-09 **RCT:** No  
**Subjects:** HUMAN **Ethics Committee:** Comitê de Ética da Faculdade de Ciências Médicas - UNICAMP **Helsinki:** Yes  
**Informed Consent:** Yes