

## CAN A PELVIC FLOOR MUSCLE CONTRACTION REDUCE VAGINAL RESTING PRESSURE AND RESTING EMG ACTIVITY?

### Hypothesis / aims of study

Overactive pelvic floor muscles (PFM) has been defined as “a situation in which the pelvic floor muscles do not relax, or may even contract when relaxation is functionally needed for example during micturition or defecation (1). Overactivity of the PFM is difficult to assess and quantify, and there is no consensus of a specific cut off point for the condition. Vaginal resting pressure and resting surface EMG (sEMG) have been suggested as methods to assess PFM overactivity. A commonly used intervention in physiotherapy to reduce muscle activity is the “contract –relax” method. The method is based on the theory that the muscle can reduce its resting activity after contraction. The purpose of the present study was to assess if there are differences in vaginal resting pressure and sEMG activity before and after PFM contraction, and to compare a possible difference in women with provoked Vestibulodynia (PVD) and asymptomatic controls.

### Study design, materials and methods

This was an assessor blinded case-control study including 70 nulliparous women. An apriori power calculation was based on data from a study of 300 nulliparous pregnant women. With an estimated clinical relevant difference in strength of 10 cm H<sub>2</sub>O, SD 12, p-value 0.05 and power 90 %, 35 women were calculated for each group. PVD was diagnosed by gynecologists according to current guidelines (2). In addition pain was rated with a 100 mm visual analogue scale (VAS) and q-tip force measurement was used to measure sensitivity of the vaginal opening at 4, 6 and 8 o'clock sites (grams of force). Assessment of PFM variables was done by two physiotherapists blinded for group affiliation.

Ability to perform a correct contraction was assessed by visual observation of the perineum and vaginal palpation. Vaginal resting pressure (cm H<sub>2</sub>O) before the first maximum voluntary contraction (MVC) and after MVC (mean resting pressure after three MVC), were assessed by a high precision pressure transducer connected to a balloon catheter (3). In addition, resting activity before and after three MVC were assessed by sEMG (μV). Anal sEMG probes instead of vaginal probes were applied to avoid pain. Paired sample T-test was used to analyze difference within groups. Student T-test was used to analyze differences between groups. Significance level was set to <0.05

### Results

Mean age of the participants was 24.3 years (SD 4.7) and mean body mass index (BMI) was 22.0 kg/m<sup>2</sup> (SD 2.6). There were no significant differences between the groups in any background variables. The PVD group tolerated significantly lower pressures than the control group in q-tip force measurement, and VAS measures were significantly higher at all sites of the introitus.

Ninety-one % and 86 % were able to perform a correct PFM contraction in the PVD and control groups, respectively. Vaginal resting pressure was significantly higher in the PVD group compared to the control group before the PFM contractions, but there was no difference in resting activity measured by sEMG. Table 1 presents the reduction of vaginal resting pressure and the sEMG before the first contraction and after three maximum voluntary contractions.

There was a significant reduction of vaginal resting pressure in both the PVD and the control group after PFM contraction. sEMG activity significantly reduced in the PVD group whereas no statistically significant difference was found in the control group.

### Interpretation of results

In the present study a reduction in vaginal resting pressure and sEMG activity was found in groups of women with PVD after voluntary PFM contractions indicating that contracting the PFM can be used as a muscle relaxation technique. However, there was no statistically significant difference between the groups in sEMG before the contraction and the reduction was small. Hence, the clinical relevance of the results can be discussed. More basic research in women with assumed overactivity of the pelvic floor muscles is warranted.

### Concluding message

Young, nulliparous women with PVD had significantly lower vaginal resting pressure and sEMG activity after contraction of the PFM. Randomized controlled trials are needed to assess the effect of this relaxation technique on PFM activity.

Table 1. Vaginal resting pressure (VRP) and vaginal resting activity (VRA) before and after 3 maximum voluntary contractions (MVC) N=70 (69) in women with Provoked Vestibulodynia (PVD) and controls. Means with standard deviations (SD).

		VRP before first contraction	VPR after 3 MVC	P-value
PVD	N=35	20.6(7.1)	17.7(5.9)	0.001
H <sub>2</sub> O(SD)				
Controls	N=35	17.8(4.4)	16.1(4.4)	0.027
H <sub>2</sub> O(SD)				
		VRA before first contraction	VRA after 3 MVC	
PVD	N=34	13.5(7.1)	11.1(7.9)	0.001
μV(SD)				
Controls	N=35	16.9(16.4)	12.8(7.2)	0.162
μV(SD)				

### References

1. Neurourol Urodyn. 2005;24(4):374-80
2. J Low Genit Tract Dis 2005 Jan;9(1):40-51
3. Neurourol Urodyn, 1990, 9: 479-487

### Disclosures

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**RCT:** No **Subjects:** HUMAN **Ethics Committee:** The regional Committee for Medical and Health Ethics South-East (REK South-East D) (2010/3257-1) **Helsinki:** Yes **Informed Consent:** Yes