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## MUSCLE STRENGTH INCREASE AND ABSOLUTE STRENGTH IN RESPONDERS AND NON-RESPONDERS TO PELVIC FLOOR MUSCLE TRAINING.

### Aims of study

Several randomized controlled trials (RCTs) have demonstrated pelvic floor muscle (PFM) exercise to be effective in treatment of genuine stress incontinence (GSI). In a previous published study we demonstrated that intensive PFM exercise combined with weekly group training was significantly more effective than the same exercises conducted at home measured with pad test with standardized bladder volume, conversion of urethral closure pressure from negative to positive during cough, subjective reports, and muscle strength (1). However, to date there is lack of published studies comparing increase in muscle strength in responders and non-responders. The aim of the present study was to compare muscle strength increase and absolute strength after PFM training in responders and non-responders to treatment.

### Methods

Strength gain and absolute muscle strength values in all 52 women who had participated in a RCT with two different programs of PFM strength training for 6 months were used for this analysis (1). Mean age was 45.4 years (range 24-64), and all women had urodynamically and clinically proven GSI. PFM strength was measured with a vaginal balloon connected to a microtip transducer (Camtech AS, Sandvika, Norway) in supine position. Correct contraction was ensured by vaginal palpation and observation of inward movement of the catheter during PFM contraction. Five parameters of improvement were combined to classify responders and non-responders to treatment: conversion of negative closure pressure to positive during cough, score as continent or almost continent by the women, improvement of stress pad test with standardized bladder volume, and improvement by leakage index (13 item, 5 point scale) and social activity index (9 item, VAS scale). Maximum sum score was 5. Patients with sum score 4 and 5 were classified as responders, patients with sum score 0 and 1 as non-responders, and patients with 2 and 3 as not classifiable (2). The results are given as mean with SEM. Student t-test and Yates correction were used to compare responders and non-responders. A significance level of 0.05 was chosen.

### Results

In the intensive exercise group 15 were classified as responders, 8 as unclassifiable, and none as non-responders. In the home exercise group 6 were classified as responders, 10 as unclassifiable, and 13 as non-responders. Hence, the total sample of 52 women comprised 21 responders to PFM exercise, 18 unclassifiable, and 13 non-responders. Numbers with increase in PFM

strength was significantly higher in the responder group compared to not classifiable and non-responders; 30 compared to 6 ( $p < .0001$ ), and 9 ( $p < .0001$ ), respectively. Comparing responders (sum score 4 and 5) with non-responders (sum score 0 and 1) there was a statistically significant difference in absolute strength after the training period;  $24.0 \text{ H}_2\text{O} \pm 3.0$  versus  $12.7 \text{ cm H}_2\text{O} \pm 3.0$  ( $p < .001$ ), and strength increase;  $14.8 \text{ cm H}_2\text{O} \pm 3.0$  versus  $5.0 \text{ cm H}_2\text{O} \pm 3.9$ , respectively ( $p = .03$ )

#### Conclusion

This analysis indicates that increase in PFM strength and the absolute strength value after a 6 months exercise period are related to the improvement of GSI. To date, there is no consensus on which outcome measure should be the gold standard for cure. However, combinations of subjective report and laboratory measurement of the condition have been recommended. A combination of 5 parameters was used to classify responders and non-responders in this analysis. The reason for not having found relations between PFM strength increase or absolute strength after training in previous studies may be due to small sample sizes. In this study both randomized groups had been assessed by vaginal palpation and observation of inward lift during contraction and had been instructed to perform the same exercises, but at different intensities. Both groups could therefore be combined for the analysis. There is a need for further RCTs with large numbers to address this issue in more detail.

#### References

- 1 Pelvic floor muscle exercise for the treatment of female stress urinary incontinence: III Effects of two different degrees of pelvic floor muscle exercises. *Neurourol Urodyn* 9: 489-502. 1990.
- 2 Pelvic floor muscle exercise for the treatment of female stress urinary incontinence: Classification and characterization of responders. *Neurourol Urodyn* 11: 497-507. 1992