

DO REGULAR EXERCISERS HAVE STRONGER PELVIC FLOOR MUSCLES THAN NON-REGULAR EXERCISERS DURING PREGNANCY?

Hypothesis / aims of study

Today, all healthy pregnant women are encouraged to be physically active throughout pregnancy, with recommendations of at least 30 min of aerobic activity on most days of the week, in addition to strength training of the major muscle groups 2-3 days per week (1). There is an ongoing debate whether general physical activity enhances or declines pelvic floor muscle (PFM) function. However, there is sparse knowledge on this relationship in the general female population and we have not been able to find any such studies in pregnant women. The aim of the present study was to compare vaginal resting pressure (VRP), PFM strength and endurance at mid-pregnancy in regular exercisers vs non-regular exercisers.

Study design, materials and methods

This study used cross-sectional data of 300 first time mothers, mean age 28.7 (SD 4.3) and pre-pregnancy body mass index (BMI) 23.9 (SD 3.9), giving birth at a public hospital. Background data, including information about physical activity level, was collected through an electronic questionnaire. For the purpose of the present study, regular exercisers were defined as women participating in exercise training ≥ 30 min ≥ 3 times per week. Women reporting exercising ≤ 30 min ≤ 3 times per week were defined as non-regular exercisers.

Two trained physical therapists assessed PFM function. Ability to contract the PFM was assessed by visual observation and vaginal palpation. Manometry, with a high precision pressure transducer connected to a vaginal balloon, was used to assess VRP (cm H₂O), PFM strength (mean of three attempts of maximal voluntary contraction; cm H₂O) and muscular endurance (measurement of area under the curve for one attempt of a 10 second holding period; H₂Osec). To ensure validity of the manometry measurements, only contractions with simultaneous inward movement of the perineum/catheter were accepted as correct contractions (2). Measurements were conducted at mean gestational week 20.8 (SD 1.4).

Data are presented as means with standard deviations (SD) and differences as means with 95% confidence intervals (CI). Differences between groups are analysed using Independent Sample T-test. Linear regression analysis was used to adjust for pre-pregnancy BMI, age, smoking during pregnancy and regular PFM training during pregnancy. P-value was set to ≤ 0.05

Results

The results are presented in Table 1. Pregnant women exercising regularly had stronger PFM and better PFM endurance than non-regular exercisers. At the time of assessment, 16 women (17.3%) of the exercisers versus 30 (14.5%) of the non-exercisers reported to do PFMT ≥ 3 times per week ($p=0.67$). Adjusted analyses showed that the difference in PFM strength was still statistically significant in favor of women exercising regularly (adjusted B=5.0 (95% CI 0.5-9.6, $p=0.03$) whereas the adjusted analyses for VRP and PFM endurance were not ($p=0.42$ and 0.1 , respectively)

Table 1. Vaginal resting pressure (VRP), pelvic floor muscle (PFM) strength, PFM endurance (area under the curve holding for 10 seconds) at mean gestational week 21.8 in exercisers (exercising ≥ 30 min $\times \geq 3$ times per week) and non-exercisers. Means with standard deviation (SD) and mean differences with 95% CI.

	Regular exercisers n=93	Non-regular exercisers n=207	Difference between exercisers and non-exercisers	p-value for differences
VRP (cmH ₂ O)	44.0 (9.8)	42.6 (9.9)	1.2 (-1.2, 3.7)	0.31
PFM strength (cm H ₂ O)	39.5 (18.3)	33.7 (17.7)	5.8 (1.4, 10.2)	0.01
PFM endurance (cm H ₂ Osec)	270.8 (132.5)	233.7 (133.1)	37.1 (4.5, 69.8)	0.03

Interpretation of results

As far as we have ascertained this is the first study investigating the association between physical activity and PFM variables during pregnancy and our results showed that women exercising ≥ 30 minutes ≥ 3 times per week had stronger PFM adjusted for possible covariates. Among possible covariates, one would expect PFM training to be the most important. Our results are in contrast to one study in non-pregnant elite athletes showing that volleyball- and basketball players had weaker PFM than a non-exercising control group (3). However, the participants in the present study were pregnant and not elite athletes and the study on elite athletes did not control for confounding factors. The strengths of the present study are the large number of participants, use of reliable and valid assessment methods and use of adjusted analyses to control for possible covariates. A limitation may be lower numbers of exercising women compared to non-regular exercisers. Given the limited scientific evidence in this area, more studies are needed to elaborate on the relationship between general physical activity, including strenuous exercise, and PFM function.

Concluding message

Pregnant women who were physically active ≥ 30 minutes ≥ 3 times per week had stronger PFM than their sedentary counterparts.

References

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Disclosures

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