

## INFLUENCE OF PELVIC FLOOR AND TRANSVERSUS ABDOMINIS MUSCLE CONTRACTION ON INTER- RECTUS DISTANCE IN POSTPARTUM WOMEN - A CROSS SECTIONAL EXPERIMENTAL STUDY.

### Hypothesis / aims of study

It has been postulated that the pelvic floor muscle (PFM) may play an important role in reducing the Diastasis Recti Abdominis (DRA) (1), and postpartum women are commonly prescribed isolated PFM and Transversus abdominis (TrA) contractions to reduce the DRA. There is scant research and knowledge on how to prevent and reduce DRA in postpartum women, and recent studies have emphasised urgent need for more studies on the relationship between the PFM and DRA (2). The aim of the present study was to investigate how the PFM contraction influence inter- rectus distance (IRD) in postpartum women presenting with a DRA.

### Study design, materials and methods

This is a cross sectional experimental study aiming to identify the acute influence of a PFM and a TrA contraction on the IRD. Parous women, 0-6 months postpartum (n=38), presenting with a DRA of two fingerwidths or more were included. A power calculation was performed based on a significance level of 0,05 and power of 0,80 resulting in a sample size of 38 parous women. The participants completed a short questionnaire on background information, symptoms of urinary incontinence (International Consultation on Incontinence Urinary Incontinence Short Form questionnaire), and symptoms of back pain (Modified Oswestry Disability Index) and pelvic girdle pain (Pelvic girdle pain questionnaire) in the postpartum period.

All measurements were done in supine position with knees bent, feet resting on the plinth, and arms resting alongside the body. The IRD was measured at two different locations; 2 cm above and 2 cm below the umbilicus, using two-dimensional ultrasound imaging. The images of the IRD were collected at rest, during a pelvic floor contraction, during a transversus abdominis contraction, and during a combined contraction of the pelvic floor and transversus muscle. A correct performance of PFM and TrA contraction was confirmed by palpation and ultrasonography prior to the actual data collection. The IRD was measured using the ultrasonography's integrated measurement tool, and presented in mm.

Background variables are shown as means with standard deviations (SD) and range, or numbers and percentages. The IRD data were found with normal distribution using Kolmogorov- Smirnov test, and inspecting Q-Q plots. A paired t- test with a 95% CI was used to examine the hypothesis of no difference between IRD at rest and during each contraction, and during PFM and TrA contractions combined (table 2). The significance level,  $p \leq 0,05$ .

### Results

38 postpartum women were included, presenting with an average age of 34,6 years (range 28- 42 years), an average BMI of 24,4 (range 20,3- 34,9), and with an average parity of 2,2 (range 1-3). There were 4 multiple births (10,5%) registered, and 73,7 % of the participants had participated in an organized postpartum exercise programme.

The results are presented in Table 1. There was a statistical significant difference ( $p < 0,01$ ) in the IRD at rest compared to IRD at PFM and TrA contractions both 2 cm above the umbilicus; 25,7mm (rest) vs. 26,9mm (PFM), 28,4mm (TrA), 29,6mm (PFM+TrA), and 2 cm below the umbilicus; 21mm (rest) vs. 22mm (PFM), 23,3mm (TrA), 24,3mm (PFM+TrA). The IRD significantly increased with PFM and TrA contractions and was largest with combined PFM and a TrA contraction (above umbilicus 3,9mm and below 3,3mm).

Table 1. IRD measures presented in mm, N = 38

Probe location		IRD Mean (SD)	IRD difference Mean (SD)	P value, difference
2 cm above	rest	25,7 (8,5)		
	vs PFC	26,9 (8,8)	ˆ - 1,2 (1,5)	< 0,001
	vs TrA	28,4 (9,0)	ˆ - 2,8 (2,6)	< 0,001
	vs both	29,6 (9,4)	ˆ - 3,9 (3,3)	< 0,001
	PFC vs TrA		ˆ - 1,6 (1,6)	< 0,001
2 cm below	rest	21,0 (7,9)		
	vs PFC	22,0 (8,3)	ˆ - 0,9 (1,9)	0,002
	vs TrA	23,3 (8,7)	ˆ - 2,3 (2,3)	< 0,001
	vs both	24,3 (8,9)	ˆ - 3,3 (3,3)	< 0,001
	PFC vs TrA		ˆ - 1,3 (1,6)	< 0,001

### Interpretation of results

These findings suggest that both PFM and TrA contractions increase the IRD. These results challenge the belief that the PFM and TrA muscles play an important role in reducing the IRD (1). Hence, clinicians ought to be cautious when prescribing isolated

PFM and TrA exercises if the aim is to reduce the IRD in postpartum women presenting with a DRA. Further studies are needed to investigate how to reduce the IRD in postpartum women presenting with DRA, and explore the importance of reducing the IRD.

#### Concluding message

This study suggests that both a PFM and a TrA contraction increase the IRD.

#### References

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#### Disclosures

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