

## PHYSIOTHERAPY IN THE REDUCTION OF DIASTASIS OF THE RECTI ABDOMINIS IN IMMEDIATE POSPARTUM

Atuação fisioterapêutica na redução da diástase abdominal no puerpério imediato

Fisioterapia para reducir la diástasis abdominal en el posparto inmediato

Gracielle Pampolim<sup>1</sup>, Bruna Ribeiro dos Santos<sup>2</sup>, Isabelle Gadiolli Verzola<sup>3</sup>, Alessandra Miranda Ferres<sup>4</sup>, Geiceane Bruna Rodrigues da Silva<sup>5</sup>, Sara Silva Sarmiento<sup>6</sup>.

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### ABSTRACT

**Objective:** to verify if the physiotherapeutic intervention in the immediate puerperium contributes to the reduction of the diastasis. **Methods:** randomized intervention study of two groups of 25 mothers recruited at a maternity hospital in Vitória-ES. Both were submitted to diastasis evaluation and measurement using a caliper, and in the treatment group, in addition to the evaluation, a physical therapy protocol was applied at 06 and 18 hours after delivery. Data were analyzed by Wilcoxon, Mann-Whitney and paired t-tests. **Results:** there was a decrease in the abdominal diastasis between the first and last evaluation in both groups and the variables studied, however, the analysis between groups identified a sharper decline in the treatment group ( $p < 0.001$ ). **Conclusion:** the findings of this study show that the physiotherapeutic care in the immediate puerperium is able to positively influence the reduction of the abdominal diastasis, providing a faster recovery to the puerperal women.

**DESCRIPTORS:** Postpartum period; Diastasis, muscle; Rectus abdominis; Physical therapy; Postnatal care.

### RESUMO

**Objetivo:** verificar se a intervenção fisioterapêutica no puerpério imediato contribui para a redução da diástase. **Métodos:** estudo de intervenção com randomização de dois grupos de 25 puérperas recrutadas em uma maternidade de Vitória-ES. Ambos foram submetidos

- 1 Physiotherapist, 3Master in Public Policy and Local Development, Professor at School of Science, Santa Casa de Misericórdia – EMESCAM, Vitória – Espírito Santo – Brazil
- 2 Physiotherapist, graduated from School of Science, Santa Casa de Misericórdia – EMESCAM, Vitória – Espírito Santo – Brazil.
- 3 Undergraduate student from the Physiotherapy Course of School of Science, Santa Casa de Misericórdia – EMESCAM, Vitória – Espírito Santo – Brazil.
- 4 Undergraduate student from the Physiotherapy Course of School of Science, Santa Casa de Misericórdia – EMESCAM, Vitória – Espírito Santo – Brazil..
- 5 Physiotherapist, graduated from School of Science, Santa Casa de Misericórdia – EMESCAM, Vitória – Espírito Santo – Brazil.
- 6 Physiotherapist, graduated from School of Science, Santa Casa de Misericórdia – EMESCAM, Vitória – Espírito Santo – Brazil.

à avaliação e mensuração da diástase através de um paquímetro, e no grupo de tratamento além da avaliação foi aplicado um protocolo de tratamento fisioterápico às 06 e 18 horas após o parto. Os dados foram analisados através dos testes de Wilcoxon, Mann-Whitney e teste *t* pareado. **Resultados:** houve diminuição da diástase abdominal entre a primeira e a última avaliação em ambos os grupos, no entanto, a análise entre grupos identificou uma redução mais acentuada no grupo de tratamento ( $p < 0,001$ ). **Conclusão:** os achados deste estudo mostram que o atendimento fisioterápico no puerpério imediato é capaz de influenciar positivamente na redução da diástase abdominal, proporcionando às puérperas uma recuperação mais rápida. **DESCRITORES:** Período pós-parto; Diástase muscular; Reto do abdome; Fisioterapia; Cuidado pós-natal.

## RESUMEN

**Objetivo:** verificar si la intervención de fisioterapia en el período posparto inmediato contribuye a la reducción de la diástasis. **Métodos:** estudio de intervención aleatorizado de dos grupos de 25 madres reclutadas en un hospital de maternidad en Vitória-ES. Ambos fueron sometidos a evaluación y medición de la diástasis utilizando un calibrador, y en el grupo de tratamiento, además de la evaluación, se aplicó un protocolo de fisioterapia a las 06 y 18 horas después del parto. Los datos fueron analizados por Wilcoxon, Mann-Whitney y pruebas *t* pareadas. **Resultados:** hubo una disminución en la diástasis abdominal entre la primera y la última evaluación en ambos grupos y las variables estudiadas, sin embargo, el análisis entre los grupos identificó una reducción más marcada en el grupo de tratamiento ( $p < 0,001$ ). **Conclusión:** los resultados de este estudio muestran que la atención de fisioterapia en el período posparto inmediato puede influir positivamente en la reducción de la diástasis abdominal, proporcionando a las mujeres puerperales una recuperación más rápida. **DESCRIPTORES:** Periodo posparto; Diástasis muscular; Recto del abdomen; Fisioterapia; Atención posnatal.

## INTRODUCTION

The muscles responsible for the safety and stability of the spine are the muscles: internal oblique, external oblique, transverse abdomen and rectus abdominis.<sup>1</sup> These muscles act synchronously with the lumbar multifidus, diaphragm and pelvic floor muscles, in order to support all pelvic and abdominal organs and protect the lumbar spine from internal and external overloads.<sup>1-3</sup>

Throughout the pregnancy period, there are significant anatomical and physiological changes in the pregnant woman's body, which culminate in changes in all systems of the human body, including increased cardiac output, respiratory, endocrine and skeletal changes. Among the most common skeletal changes are exacerbated lumbar lordosis, increased articular mobility in the sacroiliac region and articular spinal flaccidity.<sup>4</sup> In addition, with the development of the uterus during pregnancy, it is possible to observe an intense extension of the abdominal muscles up to 20 cm.<sup>5</sup>

The Recti Abdominis Diastasis (RAD) is prevalent in women with multiple births, pregnant women with twins and is also linked to weight gain during pregnancy.<sup>6</sup> The separation of this musculature varies vertically, with 70% of the population spacing between 2 cm and 3 cm in the infra-umbilical region, and the supra-umbilical region with an average spacing greater than 3.0 cm.<sup>7</sup>

The onset of RAD is often noticed in the third trimester of pregnancy and in the immediate postpartum period, and may spontaneously regress within eight weeks after delivery, however, in some cases it may remain for much longer, which could lead to increased risk in develop low back pain and pelvic instability.<sup>6</sup>

In this context, physiotherapeutic intervention is an important ally and focuses on the treatment of previous changes experienced during pregnancy, on improving body awareness and re-education of the pelvic floor and abdominal muscles, as well as the recovery of immediate postpartum, justifying the realization of the present research, which aims to ascertain the contribution of physiotherapeutic intervention in the immediate postpartum regarding the reduction of diastasis of the rectus abdominis muscle.

## METHODS

This is an intervention study with randomization, carried out with a sample of 50 puerperal women from Maternity Hospital Pró-Matre of Vitória, Espírito Santo-Brazil, from December 2016 to February 2017. Women in the immediate postpartum period were included in this study (6 hours after delivery), aged 18 years old and older, who were attending the obstetrics clinic during the research period and who agreed to sign the Free and Informed Consent Form. Postpartum women should have up to 4 children and have a diastasis greater than 3 centimeters from the rectus abdominis muscles. Postpartum women who underwent the cesarean section or who did not know how to answer the questionnaires correctly were excluded from the study, in addition to the mothers who had any pathologies associated with pregnancy such as: polyhydramnios, fetal macrosomia, hypertensive disease of gestation - DHEG and gestational diabetes.

The sample was randomized in two groups according to the order of arrival at the obstetrics clinic: control group and treatment group, both with 25 mothers. Then, an evaluation form prepared by the student researchers was applied, contemplating the socioeconomic, demographic and clinical data in order to characterize the profile of the sample and their knowledge about the presence of diastasis. After the application of the form, a physical examination was performed to measure the RAD using a single Nove54 caliper, providing accuracy and reliability to the assessment throughout the research.

To check for the presence of abdominal diastasis during the physical examination, the puerperal woman was asked to position herself in the supine position with knees and hips flexed, feet resting on the bed and arms along the body so that two markings were made, one 03 cm above and another 03 cm below the umbilical scar, and then anterior flexion of the

trunk was requested until the lower angle of the scapula was out of bed. Soon afterwards, palpation was performed between the limits of the medial edges of the muscles and the caliper was placed for accurate measurement in the supraumbilical and infraumbilical regions.

In the control group, two evaluations were performed: the first, 06 hours after delivery and the second, 18 hours after delivery. The treatment group underwent physical therapy in the period of 06 hours and 18 hours postpartum individually. Therefore, there was an interval of 12 hours between the 1st and 2nd evaluation in the control group and between the 1st and 2nd attendance for the treatment group. This interval offered the postpartum woman a break between one physiotherapeutic intervention and another, as well as the time for the organism to adapt naturally and physiologically. Interventions were performed between the hours of 7:00 am and 9:00 am in the morning, and between 7:00 pm and 9:00 pm due to the time of rest and so that the evaluations were not carried out during the night.

Treatment protocol: In the first appointment, the puerperal woman performed 10 repetitions of each exercise and in the second appointment, 20 repetitions of each exercise, as described: For the first exercise, the puerperal woman was instructed to adopt the initial supine position, with knees and hips flexed, foot supported on the bed and with the help of a pillow between the knees, and then the hip adduction movement was requested, associated with isometric contraction of the pelvic floor.

In the second exercise, the isometric contraction of the abdominal muscles was performed, mainly the transversus abdominis, with manual feedback from the researcher in the lower abdomen. And to finish the exercises, the isotonic contraction of the oblique abdominal muscles was requested, through the anterior flexion movement combined with rotation of the trunk, so that the lower edge of the scapula was removed from contact with the bed. To facilitate the performance of this exercise, the hands were crossed under the occipital region with shoulder abduction and elbow flexion.

The descriptive analysis of the collected data was performed using frequency tables and data summary measures such as mean, median and standard deviation. For the inferences analysis, the normality of the sample distribution was verified through the Shapiro-Wilk test and once the sample distribution was identified, the paired t-test was used to analyze the intra-groups Supra Umbilical variable; Test Wilcoxon for the analysis of intra-groups Infra Umbilical variable and the Mann-Whitney test for the analysis of differences between the groups. The analysis was conducted using the SPSS software (IBM 22). Significance level of  $p < 0.05$  was adopted for all analyzes.

This study was approved by the Research Ethics Committee of the School of Sciences of Santa Casa de Misericórdia de Vitória on December 13, 2016, registered under number 1.865.043. At all times in the study, the guidelines of resolution 466/12 were respected.

## RESULTS AND DISCUSSION

The sample of this study was composed of 50 women, with an average age of  $22.6 \pm 3.28$  years old, 48 (96%) declared themselves brown, 22 (44%) reported being “homemakers”, 48 (96%) were primiparous, 50 (100%) underwent prenatal care and none of them had knowledge about abdominal diastasis (data not shown in the table). No statistical differences were found between the groups studied.

As observed in Table 1, there was a decrease in abdominal diastasis between the first and the last assessment (6h and 18h, respectively), in both groups in isolation and in both variables analyzed. However, in the analysis between the groups (Table 2), it was found that in the treatment group, the decrease in supra-umbilical abdominal diastasis was more pronounced, this difference being statistically significant ( $p < 0.001$ ).

**Table 1** - Comparison of the measurement of abdominal diastasis (6 hours and 18 hours after delivery) in the supra-umbilical and infraumbilical regions in the control and treatment groups.

Abdominal Diastasis 6h	Control Group (n = 25)			
	18h	$\Delta$	$p$	
Supra Umbilical	34.5±2.8	33.9±2.8	-0.6±0.4	<b>&lt; 0.001<sup>a</sup></b>
Infra Umbilical	19.8±5.7	19.0±5.9	-0.8±0.7	<b>0.015<sup>b</sup></b>
Treatment Group (n = 25)				
	6h	18h	$\Delta$	$p$
Supra Umbilical	36.0±2.7	34.6±2.8	-1.4±0.4	<b>&lt; 0.001<sup>a</sup></b>
Infra Umbilical	22.3±3.4	21.5±3.4	-0.8±0.3	<b>&lt; 0.001<sup>b</sup></b>

$\Delta$  difference between measures; <sup>a</sup> Paired *t* Test; <sup>b</sup> Wilcoxon Test.

**Table 2** - Comparison of the differences in abdominal diastasis measurements (6 hours and 18 hours after delivery) in the supra-umbilical and infraumbilical regions between the control and treatment groups.

Abdominal Diastasis	Control Group	Treatment Group	$p$ ( $\Delta$ )
	(n = 25)	(n = 25)	
	$\Delta$	$\Delta$	
Supra Umbilical	-0.6 ±0.4	-1.4±0.4	<b>&lt; 0.001<sup>c</sup></b>
Infra Umbilical	-0.8±0.7	-0.8±0.3	0.55 <sup>c</sup>

$\Delta$  difference between measures; <sup>c</sup> Mann-Whitney Test.

During the gestational period, the Recti Abdominis Diastasis is very common, which is not necessarily normal. Although studies have shown that multiparity can predispose a greater separation of muscle fibers from the rectus abdominis during pregnancy, it was observed that most puerperal women were primiparous and all had diastasis.<sup>8</sup>

In addition, a higher incidence of supraumbilical abdominal diastasis was evidenced in this study. In

agreement with this, it was found in a study that 36% of the population had diastasis at the supraumbilical level, due to the disposition of the fetus, and 11% infraumbilical diastasis, as a result of the connection of the abdominal muscles in the shape of the letter V.<sup>9</sup>

It is noted in the present study that the performance of physiotherapy to reduce abdominal diastasis in the immediate postpartum period had an excellent impact on the reduction of supraumbilical abdominal diastasis, being statistically relevant ( $p < 0.001$ ). Similar results were also found in another study,<sup>10</sup> in which, after the intervention, there was a significant difference between the control and treatment group, corroborating with these data.

Another study analyzed, a randomized clinical trial conducted with a sample of 40 women diagnosed with diastasis, found similar results after the intervention, both in the reduction of diastasis and in the quality of life of the mothers.<sup>11</sup> A literature review that aimed to analyze physical therapy interventions in the treatment of abdominal diastasis, showed that physical therapy exercises are an important tool in the prevention and treatment of this condition in puerperal women.<sup>12</sup>

Physiotherapy is gradually gaining ground in maternity hospitals, as it has been demonstrating its benefits during pregnancy and childbirth, contributing to guidance, prevention and treatment of changes in the musculoskeletal, respiratory and circulatory systems.<sup>13</sup> Its importance gains even more prominence when analyzing the provisions in the literature, which has shown, with statistical findings, that physical therapy interventions in the immediate postpartum period are effective in reducing pain and improving the general well-being of puerperal women.<sup>14</sup>

Another noteworthy fact is that studies show a positive correlation between the size of abdominal diastasis and the intensity of low back pain perceived by pregnant women, especially those in the third trimester, and physiotherapy being an important instrument for reducing pain and discomfort in pregnant women, and in reducing abdominal diastasis, we understand the deserved highlight that this professional category has been conquering in this phase of the women's life cycle.<sup>15-14</sup>

The present study adds important results for the scientific community, however, it is worth mentioning the perceived limitations to its performance, such as the small number of participants and an important shortage of literature in this thematic area, which made it difficult to compare the results with a more up-to-date literature. Thus, we highlight the need for further studies, if possible, with more participants, to contribute to the improvement of existing knowledge on this topic.

## CONCLUSION

It is concluded that physical therapy assistance in the immediate postpartum contributed significantly to the reduction of abdominal diastasis and provided the

studied population with knowledge about this topic that is little known, favoring a healthier postpartum and consequently an improvement in the quality of life. In addition to highlighting the importance of including this theme in health education processes performed during prenatal care.

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**Corresponding author**

Gracielle pampolim

**Address:** Avenida Nossa Senhora da Penha, 2190

Vitória/ ES, Brazil

**Zip code:** 29.045-402

**Email address:** Graciellepampolim@hotmail.com

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