RESEARCH ARTICLE

Effect of Russian Current followed by Exercise in Postpartum Diastasis Recti Abdominis: A Single Case Study

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Abstract

Aim: To find out the effect of Russian currents followed by exercises in diastasis recti in postpartum.

Materials and methods: A single case study was done by fulfilled inclusion criteria. Inter-recti distance (IRD) was assessed by dial caliper and waisthip circumference by inch tape. Russian current was given for 30 minutes/day with a duty cycle of 20 seconds on period and 40 seconds off period for 5 days/week for 6 weeks. Exercises given are isometric contraction of abdominal muscle and Noble's correction exercise of 30 minutes/day for 5 days/week for every 6 weeks.

Results: The study shows IRD reduction of 1.4 cm above the umbilicus, 1.3 cm at the level of the umbilicus, and 1.3 cm below the level of the umbilicus.

Conclusion: The present study opens a wide scope to practice Russian currents for reducing IRD along with exercises for the postpartum period.

Clinical significance: Russian currents can be introduced to the postpartum physiotherapy management along with exercises as it is giving more amount of feedback to the clients.

Keywords: Diastasis recti, Diastasis recti physiotherapy, Interrecti distance, Postpartum, Russian current.

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Introduction

Diastasis recti (diastasis recti abdominis) is one of the conditions affecting women during pregnancy along with other progressive anatomical, physiological, and biomechanical changes.[1] As it is not a painful condition affecting pregnant women, it is unnoticed and untreated. The linea alba loss of its compliance after the pregnancy leading to enlarge the midline separation of two rectus abdominal muscles is the etiology of diastasis recti (weaker abdominal muscles (Fig. 1), softening of connective tissue related to hormonal release).[2] Two out of three women experience diastasis following maternity.[3] Significant diastasis is observed in 62.5% of postnatal women within 92 hours of delivery, 50 to 60% after 6 weeks, and 39 to 45% after 6 months.[4]

Diastasis is classified into three quantitative categories by Ranney: Mild—diastasis with an observed separation of more than 1 and less than 3 cm between the medial fibers of rectus abdominis; moderate—diastasis measuring 3 to 5 cm separation; and severe—diastasis measuring 5 or more centimeters separation.[1]

The symptoms of diastasis recti during physical activity include discomfort, pain,[5] corset instability, and bulging of the abdominal wall. Abdominal musculature (Fig. 2) plays a crucial role in trunk control and function. Compromise of abdominal muscle due to diastasis can diminish mechanical control of the abdomen and its function.[5] The untreated diastasis leads to altered trunk mechanism, impaired pelvic stability, postural changes, vulnerability of lumbar spine, pelvic injury, lumbopelvic pain, and discomfort.[1]

Diastasis can be corrected conservatively and surgically. Conservative treatment includes functional daily activity, back care or lifting, bracing, Tupler technique, stimulation,[6] and exercises.[7] Postnatal supporting belt and belly binding have been used for supporting abdomen.

It is important to begin postnatal abdominal exercises that are graded to the rate of recovery and predelivery level of fitness, as gradual abdominal muscle strengthening is safe and effective.[3] Postnatal exercise has many benefit for both mother and baby; it includes improved CVS fitness, easier weight loss, more energy, better lactation, and infant growth.[4] The exercise includes Noble's corrective exercise, Sahrmann progression of abdominal exercise, trunk sit-ups, reverse sit-up, trunk twist, etc. Diastasis can be corrected during cosmetic surgery procedures known as abdominoplasty (commonly referred to as tummy tuck),[5] retromuscular mesh, and quill technique.[7]

Russian current is a medium frequency electrotherapy modality, modulated sinusoidal alternating current with 25,000 Hz delivered in a series of the bust (50% duty cycle). It has been reported that the most commonly used electrical stimulation to increase muscle strength in atonia (not in plegia) is Russian current.[8,9] Lack of literature evidence on the effect of

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Russian current in managing diastasis leads us to do this study along with exercises.

Materials and Methods

After obtaining the informed consent from 30-year-old multiparous woman after 12 months of postpartum period with normal delivery (diastasis more than 4 finger width), diastasis recti were measured by the dial caliper method, and waist and hip circumference was also measured.

Dial caliper measurement (Fig. 3): Palpate the medial edge of the recti muscle border and place the dial caliper perpendicular to the recti borders while the participant was in a crook lying position with a pillow beneath the head and feet resting on a plinth.[10] The client was instructed to lift her head and shoulder off the plinth, reaching toward her knee with the outstretched arm until the spine of scapulae cleared the surface; at this point, reading was taken for the distance between two recti at levels of the umbilicus, 2 cm above and 2 cm below the umbilicus. This distance was assessed each week.

Waist and Hip Circumference Measurement

Waist circumference was measured at the narrowest level between the costal margin and the iliac crest at the end of gentle expiration, and the hip circumference was measured at the widest level over the buttocks with the patient standing. The waist-to-hip ratio was calculated by dividing the waist by the hip circumference for each week.

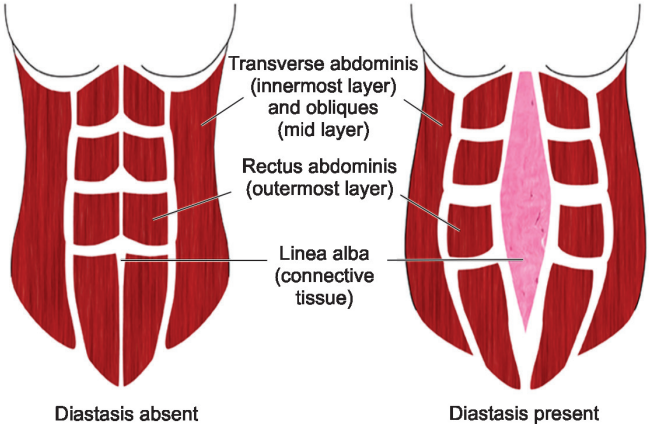


Fig. 1: Diastasis rectus diagram

Intervention

Russian current stimulation is given in relaxed supine lying position, and a duty cycle of 20:40 (stress-to-relax) was given for 30 minutes, 5 days/week for 6 weeks, by using four electrodes; 2 cm paramedian, two electrodes above the umbilicus, and other two electrodes below it; the intensity increased gradually according to the client's tolerance.

Exercises

Abdominal exercise includes isometric contraction of the abdomen, and Noble's correction exercise was performed for 30 minutes/session, five times per week for 6 weeks.[11,12,13] Isometric contraction of the abdomen: The patient was in a crock lying position and arm along the side. Then, we asked the patient to draw in abdominal by pressing the lumbar region down on the plinth for 10 seconds.[14,15] Noble's correction exercise (Fig. 4): From crock lying position, the patient was instructed to cross her hand at the waist and guide the recti muscle toward the midline to stabilize the muscles, take a deep breath, while she expires slowly and asked to lift her head and scapula off the floor and at the same time contract the pelvic floor muscle and abdominal muscles. Then, the patient slowly returns to starting position as she breaths in, and this was repeated 10 times.

Results

This study shows a reduction in inter-recti distance (IRD) after the 6 weeks of treatment with Russian current in multiparous client after 12 months of postpartum period with normal delivery. Before the treatment session, IRD was 4.3, 4.4, and 4.3 cm above the umbilicus, umbilical level, and below the umbilicus, respectively. Gradual reduction observed in IRD values at end of every week measurements and the end of sixth-week readings was 2.9 cm above the umbilicus, 3.1 cm at the umbilicus, and 3.2 cm below the umbilicus (Table 1).

Waist-to-hip ratio was also reduced because of the reduction in waist and hip circumference in every week following the treatment session (Graph 1).

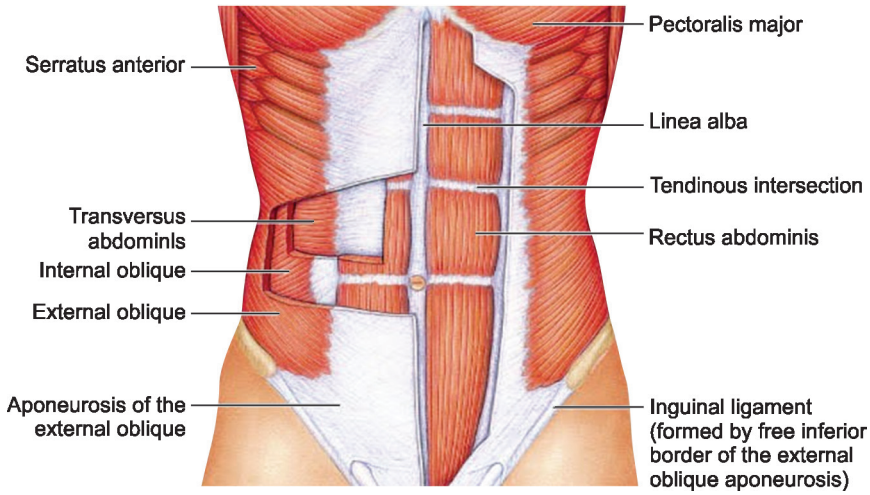
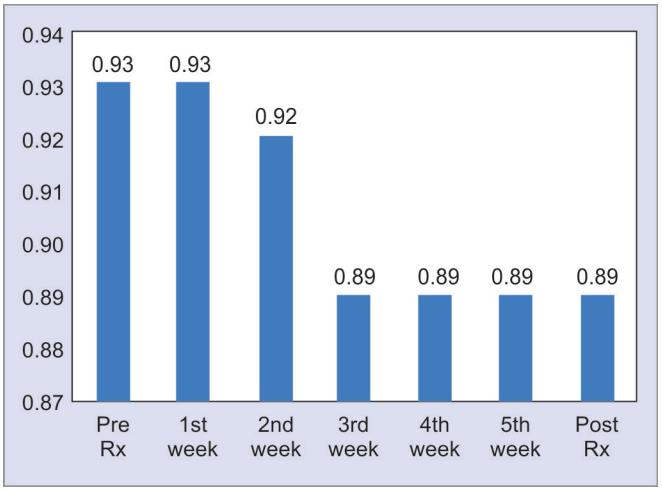


Fig. 2: Anatomy of abdominal muscles

Fig. 3: Dial caliper (Dazqua® premium tool)

Fig. 4: Client performing Noble's correction exercise



Graph 1: Changes in waist-to-hip ratio along the treatment course

Discussion

There is a lack of literature available on the application of Russian current in the treatment of diastasis recti; hence, this present study is conducted to find out the effect of Russian current followed by exercise in reduction of diastasis recti abdominis muscle. Many studies are conducted on conservative treatment of diastasis recti abdominis immediately after and up to 6 months postpartum.

The changes that happened in the client are because of the electrophysiological changes that happened due to Russian current stimulation and exercises. Due to the Russian current stimulation along with exercises, we find out the changes in abdominal muscle tone in the very first week itself. This shows our interest to continue the study for 6 weeks, and changes are documented. The client observed her postural changes, efficient daily activity, and much control of the core following the treatment, and the findings are related to her previous delivery.

Conclusions

IRD was reduced following the treatment with Russian current along with exercises at a faster rate. So, we recommend Russian current stimulation to be taken into consideration during the postpartum rehabilitation phases. Also, we recommend researchers to study on the effect of Russian current on diastasis in a larger sample size.

Clinical Significance

The present study opens a wide scope to practice Russian currents for reducing IRD along with exercises for the postpartum period. Russian currents can be introduced to the postpartum physiotherapy management along with exercises as it is giving more amount of feedback to the clients.

Table 1: Pre-post differences in the test variables

Changes in test parameters after each week treatment								
Variables		*Pre-treatment*	*After 1st week*	*After 2nd week*	*After 3rd week*	*After 4th week*	*After 5th week*	*Post-treatment*
	Above umbilicus	4.3	4.2	4.1	3.8	3.3	3	2.9
Dial caliper measurement (cm)	Umbilicus	4.4	4.3	4.2	3.9	3.6	3.4	3.1
	Below umbilicus	4.3	4.2	4.1	4	3.6	3.4	3.2
Waist circumference (cm)		100	99	97	93	91	89	86
Hip circumference (cm)		107	107	106	104	102	99	97

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