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Research Article

COMPARISON BETWEEN THE EFFECT OF ABDOMINAL SUPPORTING BELT WITH ABDOMINAL EXERCISES AND ONLY ABDOMINAL EXERCISES IN REDUCING DIASTASIS RECTI A PILOT STUDY

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A R T I C L E I N F O

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Post –partum females, diastasis recti, abdominal exercises, abdominal supporting belt, dial calliper.

A B S T R A C T

Background: Diastasis recti is commonly defined as a gap of roughly 2 cm or more between the two sides of rectus abdominis muscle .It principally occurs in two populations: newborns and in pregnant or post partum women.
Objective: To study the effect of abdominal supporting belt with abdominal exercises and only abdominal exercises in reducing diastasis recti.
Methodology: This was an experimental pre and post interventional study .20 postpartum females between the age of 25 to 35 were checked for diastasis recti >2cm, which was measured using a dial calliper. The subjects were randomly divided into two groups Group A and Group B. Group A was given an abdominal supporting belt and abdominal exercises. Group B were given only abdominal exercises. Once a day, three sessions per week were done for 4 weeks. Diastasis recti was checked again in both the groups at the end of 4 weeks. Data was collected and statistically analysed using unpaired t-test.
Results: Abdominal exercises with belt showed significant reduction in diastasis recti than only abdominal exercises in post partal women ($p<0.0001$)
Conclusion: Abdominal exercises with belt are better in reducing diastasis recti in post partal women than only abdominal exercises.

INTRODUCTION

The Rectus Abdominis Muscle, also known as the 'abdominals' or 'abs' , is a paired muscle running vertically on each side of the anterior wall of the human abdomen . They are two parallel muscles separated by a midline band of connective tissue called 'lineaalba'. It extends from pubic symphysis, pubic crest and pubic tubercle inferiorly to xiphoid process and costal cartialages of ribs V TO VII superiorly. Its nerve supply is by thoraco abdominal nerves (T7 to T11) and subcostal (T12). Its blood supply is by inferior epigastric vessels and its main action is trunk flexion[1].

Diastasis Recti

Diastasis recti is commonly defined as a gap of roughly 2 cm or more between the two sides of rectus abdominis muscle. The distance between the right and left rectus abdominis muscle is created by the stretching of linea alba[2].
It principally occurs in two populations:

- In newborns, the rectus abdominis is not fully developed and may not be sealed together at midline[3].
- In pregnant or post partum women, the condition is caused by the stretching of the rectus abdominis by the growing uterus. It is more common in multiparous women due to repeated episodes of stretching[2].

Women are more susceptible to develop diastasis recti , in cases of high birth weight of the child, multiple birth pregnancy[2,5]

A period after delivery is called puerperium or post-partum period. During pregnancy the changes caused by relaxin, progesterone and estrogen combined with uterine growth may cause stretching of the abdominal muscles that mainly affects rectus abdominis[2]. Due to the biomechanical changes and stretching of the muscles there is production of musculoskeletal complaints such as low back pain as abdominal musculature and thoracolumbar fascia fail to stabilise pelvis and lumbar spine[4]

Abdominal Exercises

Abdominal exercises are those affect the abdominal muscles. Abdominal exercises are advised in immediate post-partum period as gradual abdominal strengthening is safe and effective[6].

It not only helps with physical appearance, but it also keeps the back healthy as a stable core is created by strong abdominals[7].

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It is very useful in supporting low back during daily activities[6].

Abdominal Supporting Belt

For many centuries women have been using abdominal supporting belt as a way of supporting a women's abdomen[8,9.] An abdominal supporting belt provides all around trunk support by helping to re-distribute extra body weight for large men and women, as well as assisting with abdominal muscle strains, pregnancy etc[8,9].

An abdominal supporting belt is a wide compression belt that encircles your abdomen, they come in many sizes and widths. Most are made of elastic and Velcro or hook and loop closures[9,10.]

MATERIALS AND METHODOLOGY

Type of Study: Comparative Study (Pilot).

Population: Post Partum Females.

Duration of Study: 12 months.

Sample Design

Type of Sampling: Convenient sampling.

Sample Size: 20.

Location: Metropolitian city.

Selection criteria

Inclusion criteria

- Post –partum female (Multiparous) within 1 month.
- Age group 25-35.
- Diastasis recti more than 2 cm.
- Women who had full term normal delivery.

Exclusion Criteria

- Any neurological disorders.
- Women who had lower segment caeserian section.
- Cardiovascular diseases.
- Severe respiratory diseases.
- Recent pelvic fractures.

Materials

1. Abdominal Supporting Belt
2. Pen
3. Paper

Dial Calliper

PROCEDURE

20 females were selected for this study .All the subjects were given a brief explanation about the study. The subjects were screened according to the inclusion and exclusion criteria. A written consent form was signed by all the subjects and only willing subjects were included in the study. 4 weeks follow-up was done. Before starting, diastasis recti was checked using a dial calliper

Method

In order to measure diastasis recti with a calliper, the subjects were asked to assume a crook lying position with head resting on pillow and feet resting on plinth. Two points were marked 1) 4.5cm above umbilicus midpoint 2)4.5 cm below umbilicus midpoint. Each subject was asked to cross arms across chest and to raise her head until spine of scapula is off the table. The subjects were then asked to maintain this position while the examiner palpates medial borders of right and left rectus abdominis muscles at marked location. The jaws of dial calliper were positioned at the locations of palpating fingers, perpendicular to the direction of muscles and adjusted to perceived inter recti distance width[11].

The subjects were randomly divided into two groups Group A and Group B. Group A were given an abdominal supporting belt and abdominal exercises. The subjects in Group A were instructed to wear abdominal supporting belt all day long and to remove it only during bathing, toileting and sleeping. Subjects were instructed to avoid over tightening the belt as it may cause discomfort.

Exercises given were same as those given to Group B. Group B were given only abdominal exercises which include static abdominal contraction, head lift with bracing ,head lift and pelvic tilt with bracing, pelvic clock exercise, double straight leg raising[12,13 ,14].

Static abdominal contraction: The subjects were in crook lying position. They were asked to draw in the abdomen by pressing the lumbar region downwards on plinth hold this for 10 seconds. In this position they were asked to place their fingers on abdominal wall at waist line and to gently draw the area beneath inwards. Maintain this abdominal activation for 10 seconds for 5 to 7 repetitions along with normal breathing throughout the treatment.

Head lift with bracing: The subjects were in crook lying position with their hands crossed over midline at the level of diastasis for support. Subjects were asked to lift only their head slowly to a point before the bulge appears, at this time subjects hands were to gently approximate the rectus muscles to midline and lower their head slowly and relax.5 to 7 repetitions along with normal breathing throughout the treatment.

Head lift and pelvic tilt with bracing: The subjects were in crook lying position with arms crossed over midline at the level of diastasis recti for support. The subject was asked to lift their head while approximating the diastasis and simultaneously performing a posterior pelvic tilt i.e to press the lumbar region downwards. Then slowly lower the head and relax.

Pelvic clock exercise: The subjects were in crook lying position. They were asked to visualize a clock on the abdomen with umbilicus being 12 o'clock and pubic symphysis being 6 o'clock. They were asked to gently move from 12 o'clock to 6 o'clock. Then side to side motion that is 3 o'clock and 9 o'clock, left -side weight shift then right side weight shift respectively. Then they were asked to move in clockwise then in anticlockwise motion. 5 to 7 repetitions of each motion were done.

Double straight leg raise: The subjects were in supine lying position. They were asked to slowly raise both their legs simultaneously with knees extended only upto 30 cm from the plinth not more than that. Then they were asked to hold this position for 5 to 10 seconds as possible then gently lower both the legs and relax. They were asked to regulate normal breathing throughout the exercise and 5 to 7 repetitions as tolerated were performed.

Once a day, three sessions per week were done for 4 weeks. The subjects were instructed to follow home program on other days. Diastasis recti was checked again in both the groups at the end of 4 weeks. Data was collected and statistically analysed using unpaired t-test.

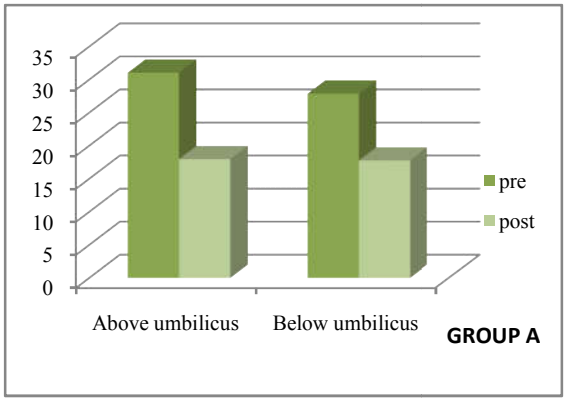
RESULTS

There was statistical significant difference between the effect of abdominal supporting belt with abdominal exercises than only abdominal exercises on diastasis recti in postpartum women ($p<0.0001$).

Descriptive Statistics

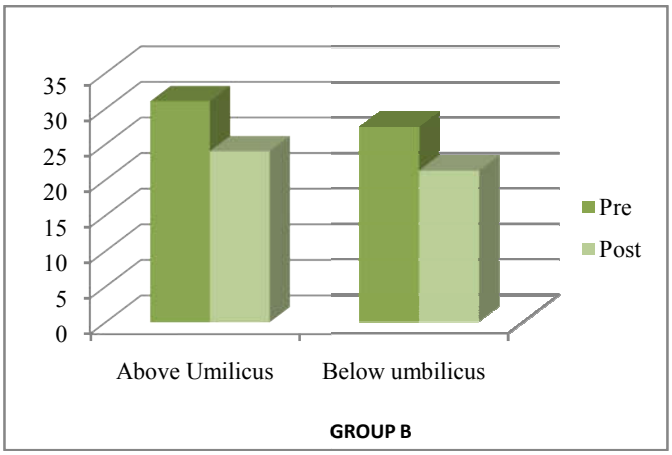
AGE	MEAN	SD
GROUP A	29.6	±2.01
GROUP B	28.6	±2.06

The above table shows descriptive statistics of age group.



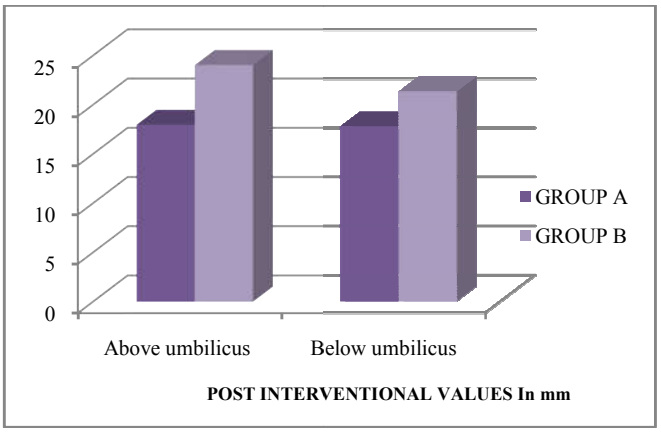
	Above Umbilicus	Below Umbilicus
PRE	31.07	27.89
POST	17.99	17.79
P VALUE	<0.0001	<0.0001
SIGNIFICANT	YES	YES

Graph 1 Effect of Abdominal Exercises With Belt On Diastasis Recti



	Above Umbilicus	Below Umbilicus
PRE	31.09	27.46
POST	24.06	21.35
P VALUE	<0.0001	<0.0001
SIGNIFICANT	YES	YES

Graph 2 Effect of Only Abdominal Exercises On Diastasis Recti



	Above Umbilicus	Below Umbilicus
Group A	17.99	17.79
Group B	24.06	21.35
P Value	<0.0001	<0.0001
Significant	YES	YES

Graph 3 Comparison Between The Effect of Abdominal Exercises With Belt (Group A) And only Abdominal Exercises on Diastasis Recti(Group B)

DISCUSSION

In this study 20 subjects with age group between 25-35 years multiparous were included. The individuals were divided equally, into two groups, Group A and Group B .Group A included individuals who were told to do abdominal exercises with belt and Group B included individuals who were told to do only abdominal exercises for 4 weeks.

The purpose of this study was to compare the effect of abdominal exercises with belt, and only abdominal exercises on Diastasis Recti.

Diastasis recti is a gap of 2 cm in between the two sides of rectus abdominis muscle. In pregnant or post partum women, the condition is caused by the stretching of the rectus abdominis because of the hormonal influences caused by the growing uterus .Different abdominal exercises mentioned above were given in order to reduce diastasis recti .In Group B

there was a significant decrease in diastasis recti post exercises sessions. This reduction might be because of the facilitation, concentric activation and stabilization of the abdominals occurring due to the exercise[11]. This study, stated that inter recti distance decreases during abdominal isometric contraction, suggesting that abdominal strengthening exercises contributes to narrowing of inter recti distance in post partum women[15] .Another study by *Amel M Yussuf* et al,correlates with previous study which states that posterior pelvic tilt exercise did not increase the amount of separation between 2 recti at upper or lower part of abdominis as well as not produce abdominal bulging when performed . Abdominal strengthening exercise contributes to the narrowing of inter recti distance in postpartum women[16]. As there is narrowing in between the medial borders of the rectus abdominis muscles ,this might help in healing as the medial borders of the muscles are brought closer.

In group A there was a significant decrease in the diastasis recti post exercise sessions, this might be because during exercise the abdominal supporting belt improves the strength of abdomen, thereby increases the intra abdominal pressure that contributes to mechanical spine stability through co activation of trunk flexors and extensors musculature. As the abdominals contract, intra abdominal pressure increases and converts the abdomen into a rigid cylinder that greatly increases the stability of the spine, decreases abdominal separation[10].The abdominal supporting belt keeps the muscles from being continuously in stretched position thus decreases the intra-abdominal force on the connective tissue when you bend over or reach for an object. Also it binds the muscles together throughout their activities of daily living. This combined action of the belt with exercises consisting of passive support with the belt throughout the day with active concentric contraction of the muscle might be the reason that there was significant decrease in diastasis recti.

Thus our study shows that abdominal supporting belt when used along with abdominal exercises; was more beneficial in reducing diastasis recti than only exercises in post partal women.

CONCLUSION

This study concludes that abdominal exercises with abdominal supporting belt has better improvement in reducing diastasis recti than only abdominal exercises in post partal women.

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