# Role of Exercise in Preventing Diastasis Recti in Pregnant Women

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## ABSTRACT

***Objective***: To see the effect of exercise in preventing diastasis recti in pregnant women.
***Study Design*:** Prospective comparative study.
***Place and Duration of Study***: Gynecology & Obstetrics, Avicenna Medical College, Lahore Pakistan, from Jan to Dec 2019.
***Methodology***: This study included 93 pregnant women who were randomized in two groups, exercise group and non-exercise group. The measurement for diastasis recti abdomen was taken at 3 locations: at the umbilicus, 5 cm above the umbilicus, and 5 cm below the umbilicus. Measurement for diastasis recti were done at the time of inclusion in study and 6 weeks after the termination of pregnancy.
***Results***: The mean age of the women in our study was 26.5 ± 0.62 years. The frequency of diastasis recti was far less in exercising pregnant women as compared to non-exercising pregnant ladies after 6-weeks postpartum period. No diastasis recti was present at the supra-umbilical level in 34 (36.55%) women of exercise-group as compared to 9 (9.67%) in non-exercise group. At supra umbilical level, there was no diastasis recti present in 43 (46.2%) women of exercise-group as compared to 7 (7.52%) women in non-exercising groups at 6-weeks postpartum period. Similarly, no diastasis recti were present in 43 (46.2%) women of exercise-group as compared to 8 (8.60%) women in non-exercising group at infra umbilical level at 6 weeks postpartum period. Result showed that there was statistically significant improvement in the diastasis recti abdominis in exercise-group ($p$=0.002).
***Conclusion***: Abdominal exercises help in reducing diastasis recti in pregnant women significantly as compared to pregnant women not participating in any exercise.

**Keywords**: Diastasis recti, Divarication of recti, Ventral hernia.

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## INTRODUCTION

Rectus abdominis muscle separation in the mid line at linea alba is called diastasis recti abdominis.[1] A bulge in the midline abdominal wall which can be seen on maneuvers causing contraction of abdominal muscles or a palpable bulge in the midline of abdominal wall which is more than 2cm or two finger breadth is considered as diastasis recti abdominis.[2] Diastasis recti abdominis is very common in pregnancy. In many women, diastasis of recti abdominis may not resolve even after termination of pregnancy. The reported incidence of diastasis recti abdominis in pregnant women after third trimester varies from 66-100%.[3,4] Boissonnault and Blaschak in their study described that 66% women had diastasis recti in the last trimester of pregnancy.[3] The incidence was 100% of diastasis recti abdominis in pregnancy was reported by Giridharan *et al*.[4]

Diastasis recti abdominis predisposes the increase incidence of ventral hernias, pelvic joints instability and low back pain. The factors responsible for diastasis recti abdominis during pregnancy are mechanical effect of pregnancy on abdominal muscles and increased level of hormones such as relaxin, progesterone, and estrogen.[5]

The current recommended regime for diastasis recti abdominis is the exercise in pregnancy.[6] The exercise in pregnancy not only help in maintaining tone of abdominal muscle, it also helps in overall well-being and activity of the women which in turn reduces low back ache and labor pains.[7]

There are very few studies conducted on diastasis recti abdominis in our local settings. We conducted this study to see the advantage of exercise in preventing the diastasis recti abdominis. This will help in making guidelines for our patients to reduce the incidence of diastasis recti abdominis in our local scenario and its complications such as ventral hernias and low backaches.

## METHODOLOGY

This prospective comparative study was conducted at the Department of Gynecology & Obstetrics, Avicenna Medical College, Lahore, from January to

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December 2019. Non-probability convenient sampling technique was used to recruit the pregnant women who consented to participate in the study.

**Inclusion Criteria**: Women with 16-35 weeks of pregnancy, having single fetus were included in the study.

**Exclusion Criteria**: Pregnant woman with twin, triplet or multiple fetuses or comorbid disease like diabetes, ischemic heart disease and hypertension were excluded from the study. Pregnant women who needed caesarean section or episiotomy or who were part of some other exercise program were also excluded from study.

This study included 93 pregnant women from 18-45 years who were randomized in two groups (exercise group and non- exercise group) using computer generated randomization chart. An approval from Ethics Committee (Serial no. 24) was obtained. History was taken and recorded. Examination was performed and all the necessary investigations were carried out.

Participants in the exercise-group were ladies who had a 6 week antenatal exercise program (Table-I). All the participants were taught about the program and were given written leaflets. The pre-natal exercise program comprised of 6, 20-minute classes which focused on the abdominal muscle strengthening, pelvic floor exercises, and education in prenatal body mechanics.

**Table-I: Exercises schedule.**

| Exercises | Positions | Repetitions | Sets |
|---|---|---|---|
| Head Lift with splinting Kegels | Sitting | 10 | 2 |
| Pelvic Tilts | Supine, Standing | 10 | 2 |
| Advanced Pelvic Tilts | Supine | 10 | 2 |
| Military Press | Sitting | 10 | 2 |
| Seated Squeeze | Sitting | 10 | 2 |
| Seated Transverse | Sitting | 10 | 2 |
| Approximation | Supine | 10 | 2 |
| Heel Drop with Core activation | Supine | 10 | 2 |
| Heel side with core activation | Supine | 10 | 2 |

Simple measuring tape was used to measure diastasis recti abdominis. The separation of recti was measured in both groups on flat abdomen on examination table. The measurement for diastasis recti abdomen was taken at 3 locations: at the umbilicus, 5 cm above the umbilicus, and 5cm below the umbilicus. Measurement for diastasis recti were done at the time of inclusion in the study and 6 weeks after the termination of pregnancy. Average sizes were calculated for both groups at three abdominal locations.

Data were analyzed by using Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistics were calculated for height, weight, age, weeks of pregnancy and diastasis recti abdominis size. Independent sample t-test was used to compare the both groups. The *p*-value of ≤0.05 was considered statistically significant

## RESULT

The mean age of women in our study was 26.5 ± 0.62 years. This study included 93 patients who had normal vaginal delivery. The detail description of the exercises carried out during pregnancy and in postpartum period were mention in Table-I. There were 47 (50.53%) women in exercise-group and 46 (49.46%) in non-exercise group. The demographic features of all the women are shown in Table-II.

**Table-II: Demographic features of pregnant women (n=93).**

| Parameters | Exercise-Group n=47 | Non Exercise-Group n=46 | *p*-value |
|---|---|---|---|
| | Mean ± SD | Mean ± SD | |
| Age (Years) | 26.6 ± 0.62 | 25.8 ± 0.65 | 0.482 |
| Gestational Age at the time of inclusion (weeks) | 26.06 ± 0.86 | 25.4 ± 0.91 | 0.735 |
| Weight (KG) | 80.12 ± 1.32 | 76 ± 1.39 | 0.690 |
| Height (cm) | 160.5 ± 1.22 | 160.39 ± 1.02 | 0.808 |
| Previous Pregnancies | 1.89 ± 0.84 | 2.1 ± 0.97 | 0.214 |

The frequency of diastasis recti was far less in exercising pregnant women as compared to non-exercising pregnant ladies after 6 weeks postpartum period. There was no diastasis recti present at supra-umbilical level in 34 (36.55%) woman of exercise group as compared to 9 (9.67%) woman in non-exercising group. At supra umbilical level, there was no diastasis recti present in 43 (46.2%) women of exercise group as compared to 7 (7.52%) women of non-exercising groups after 6-weeks postpartum period. Similarly no diastasis recti was present in 43 (46.2%) women of exercise group as compared to 8 (8.60%) women of non-exercise group at infra umbilical level 6 weeks postpartum period. The diastasis recti was present in 6 (6.45%) ladies of exercise group as compared to 39 (41.93%) women of non-exercise groups 6-weeks postpartum period at umbilical level while diastasis recti was present in only 4 (4.30%) women of exercise group as compared to 38 (40.86%) women of non-exercise group at infra umbilical level 6 weeks postpartum period (Table-III). Result showed that there was statistical significant improvement in diastasis recti abdominis in exercise

group ($p$=0.002). There was no infant and maternal mortality in our study.

**Table-III: Comparison of diastasis recti between groups (n=93).**

| Time | Site | Groups | | *p*-value |
|---|---|---|---|---|
| | | Exercise n=47 | Non-Exercise n=46 | |
| At the Time of Inclusion in the study | **Supra Umbilical** | | | |
| | ≤20 | 44 (47.31) | 44(47.31) | - |
| | 21-40 | 2 (2.15) | 1 (1.07) | |
| | 41-60 | 1 (1.07) | 1 (1.07) | |
| | >61 | | | |
| | **Umbilical** | | | |
| | ≤20 | 43 (46.2) | 45 (48.38) | - |
| | 21-40 | 2 (2.15) | 1 (1.07) | |
| | 41-60 | 1 (1.07) | | |
| | >61 | 1 (1.07) | | |
| | **Infra Umbilical** | | | |
| | ≤20 | 43(46.2) | 45 (48.38) | - |
| | 21-40 | 1 (1.07) | | |
| | 41-60 | 3 (3.22) | | |
| | >61 | | 1 (1.07) | |
| 6 Weeks Post-partum | **Supra Umbilical** | | | |
| | ≤20 | 34 (36.55) | 9 (9.67) | <0.001 |
| | 21-40 | 6 (6.45) | 9 (9.67) | |
| | 41-60 | 4 (4.30) | 14 (15.05) | |
| | >61 | 3 (3.22) | 14 (15.05) | |
| | **Umbilical** | | | |
| | ≤20 | 43 (46.2) | 7 (7.52) | <0.001 |
| | 21-40 | 2 (2.15) | 6 (6.45 | |
| | 41-60 | 2 (2.15) | 10 (10.75) | |
| | >61 | | 23 (24.73) | |
| | **Infra Umbilical** | | | |
| | ≤20 | 43 (46.2) | 8 (8.60) | 0.002 |
| | 21-40 | 3 (3.22) | 4 (4.30) | |
| | 41-60 | 1 (1.07 | 18 (19.35) | |
| | >61 | | 16 (17.20) | |

## DISCUSSION

Diastasis recti abdominis is a common problem in women after pregnancy. Estimated prevalence of diastasis recti abdominis is very high.[8] A study conducted by Akram *et al*, showed a prevalence of 64% in Pakistan.[1] Internationally reported incidence of diastasis recti abdominis in pregnant women after third trimester varies from 66-100%.[3,4] Diastasis recti abdominis is associated with many problems in women such as ventral hernia, low backache, pelvic joint instability, constipation and urinary incontinence.[9,10] These problems sometimes need prolong treatment that may include surgery, prolong medications and psychological management.[11]

The abdominal wall is composed of two rectus abdominis muscles and three flat muscles that include the external oblique, internal oblique, and transversus abdominis.[12,13] These muscles not only flex and rotate the trunk they but also strengthen the abdominal wall and reduce the risk of herniation.[14] The rectus sheath is an aponeurosis formed by the five muscles of the abdomen and in the midline these aponeurosis fuse to form the linea alba.[15] Linea alba joins the rectus abdominis in the midline.[16]

The treatment options for diastasis recti abdominis vary. Most of the time it is left for spontaneous recovery.[17] In recent times, there is focus on physiotherapy and exercise program during and after the pregnancy.[18] There is no general consensus over to which type of exercise program should be used but many studies have shown advantage of exercise programs.[19] One treatment options is 'noble technique' which included manual approximation of rectus abdominis muscles during a partial sit-up, manual soft tissue mobilization and myofascial release.[20] Other more rigid treatments include abdominal bracing, taping and a corset.[21] Keeller *et al*, reported that abdominal taping is very frequently used method but its benefit in improving diastasis recti abdominis has not been confirmed so far.[22] Surgical repair and strengthening with mesh is also reported in many studies.[23] Rath *et al*, studied the diastasis recti in non- pregnant women and measured the size of abdominal separation. They used CT scan to measure the separation of linea alba at three different points and reported the abdominal separation at 8.3 mm above umbilicus, 21.2 mm at umbilicus and 9.3 mm below umbilicus.[24] Our results were comparable with the results of Ruth *et al*.

Our study showed that there was significant improvement in abdominal separation after exercises in pregnant women as compared to women who did not participate in abdominal wall exercises. There were 27.65% diastasis recti abdominis in women who participated in regular exercise program as compared to 82.60% diastasis recti abdominis in women who did not participate in exercises.

This study has provided a very good result in overall improvement of the diastasis recti abdominis and showed that exercises were safe during the pregnancy and did not harm mother and baby. We have plan to continue this study on larger sample to see its benefit on larger population.

In our study, we found that exercises during pregnancy were safe and provided very good improvement in managing the diastasis recti abdominis as compared to patient who did not participate in exercise program. We recommend that every pregnant wo-

men should be included in some exercise program to strengthen the abdominal muscle and prevention of diastasis recti abdominis.

## LIMITATIONS OF STUDY

This study has the limitation of small sample size, which needs to be tested on the larger population sample.

## CONCLUSION

Abdominal exercises help in reducing diastasis recti in pregnant women significantly as compared to pregnant women not participating in any exercise.

**Conflict of Interest:** None.

**Authors' Contribution**

SNM: Study design, BAK: Writing Study, SFS: Data collection, SHS: Data collection.

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