Effect of Kinesiotaping on Diastasis Recti in Post-Partum Women

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Abstract

Background: Diastasis recti is a separation of rectus abdominis muscles in the midline at the linea alba. Diastasis recti may occur in pregnancy as a result of hormonal effects on the connective tissue and the biomechanical changes of pregnancy.The kinesio taping results shows increased fluid flow through an injured area, better control over muscle contractions, reduced pain, and ultimately faster healing. **Methodology:** Permission was taken from institutional ethical committee. Subjects were selected by convenient sampling method. Patients were evaluated pre and post for diastasis recti using finger-width test and for disability assessed by using modified oswestry disability index. **Result:** The analyzed data showed that it was not a normal distribution using shapro -Wilk test hence Non parametric test-Wilcoxon sign rank test was performed to analyze the data within the groups. Diastasis recti of group A above umbilicus level pre-intervention mean was 3.040±0.4643 and post-intervention mean was 0.2350±0.3986. At umbilicus level pre-intervention mean was 3.100±0.3482 and post-intervention mean was 0.2950±0.4026and below umbilicus level pre-intervention mean was 2.435±0.4802 and post-intervention mean was 0.035±0.1466. In group B above umbilicus level pre-intervention mean was 2.965±0.5088 and post-intervention mean was 0.365±0.4542. At umbilicus level pre-intervention mean was 3.215±0.4988 and post-intervention mean was 0.4100±0.4626 and below umbilicus level pre-intervention mean was 2.115±0.5461 and post-intervention mean was 0.1350±0.3397. Comparison between the groups was done using Mann-Whitney U Test above umbilicus p value is 0.0059 which is very significant, at umbilicus p value is 0.9072 which is not significant, below umbilicus p value is 0.1124 which is not significant.

Conclusion: Our study shows that kinesio taping with exercise shows greater effect on diastasis recti than only exercises in post-partum women.

Keywords: *diastasis recti, kinesio taping, finger-width test, modified oswestry disability index*

Introduction

Post-partum is period following the childbirth or period after pregnancy. Women after childbirth there is physiology and structural changes in their appearance and shape that may require repair in order to restore their physical and psychological well- being. There is increase in abdominal girth during pregnancy that causes stretching and thinning of the midline abdominal fascia, thus aggravating preexisting diastasis of the rectus muscle that can result muscle that can result in herniation or protrusion of abdominal contents.[1]

The condition of diastasis recti may produce musculoskeletal complaints, such as low back pain, it result of decreased ability of the abdominal musculature and thoracolumbar fascia to stabilize the pelvis and lumbar spine.[2]

It has been claimed that Diastasis recti abdominis may changes posture and give more back strain due to reduced strength and function, leading to low backpain.[3]

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Kinesio tapeis acomparatively new technique used in rehabilitation programs. It is increasingly become an adjunct treatment option for the other musculoskeletal impairments, correcting muscle function by strengthening weakened muscles and improving circulation of blood and lymph by eliminating tissue fluid and skin by moving the muscle, decreasing pain through neurological suppression and repositioning sublaxed joints by relieving abnormal muscle tension, helping to return the function of fascia and muscle.

There are total five different corrective applications of KT which include the following : mechanical correction fascia correction; space correction; ligament / tendon correction; functional correction, that provide several potential effects of KT, depending which technique is used and degree of tape stretch, providing the sensory stimulation, aligning fascia tissues, reposition of sublaxed joints, minimizing pain/inflammation, assisting in the reduction of edema in the addition to inhibit muscle function.[5]

The elastic quality and proprioceptive input as well as subtle biomechanical factors of kinesio taping may account for the functional changes observed. When the application procedure is correct, the taped area can be used to facilitate a weakened muscle or to relax an overused muscle. The method for applying the tape varies depending on the specific goals such as improve active range of motion, relive pain, adjust misalignment, or improve lymphatic circulation.[4]

Method

Permission was taken from institutional ethical committee. Different hospitals were approached and permission was obtained prior to the study. 200 subjects were selected by convenient sampling method. Post-partum women were selected who had normal delivery, after 1 month of women who had caesarian section. Women who were having sensitivity of taping, open wounds, any recent abdominal surgery and abdominal hernia were excluded for the study. The study was explained to the patient. The pre and post intervention assessment were done for diastasis recti with finger-width test. The abdominal strength were assessed by sphygmomanometer anddisability were assessed by modified oswestry disability index. The exercise program was given 45 minute of session 3days/week for 4 weeks. In group A kinesio taping was applied for 6days/4week with exercises. The exercises includes the corrective exercise for diastasis recti, stabilization exercises with progressive limb loading for abdomen and trunk.

Exercise program:

Week 1: In conventional therapy

1. Corrective exercise of diastasis recti:

- Head lift: Patient position and procedure: Hook-lying with her hands crossed over midline at the level of the diastasis for support. Have the woman exhale and lift only her head off the floor or until the point just before a bulge appears. At the same time, her hands should gently approximate the rectus muscles toward midline. Then have the woman lower her head slowly and relax. 5 repetition without hold.

- Head lift with pelvic tilt-Patient position and procedure: Hook-lying. The arms are crossed over the diastasis for support as above. Have the patient slowly lift her head off the floor while approximating the rectus muscles and performing a posterior pelvic tilt, then slowly lower her head and relax. All abdominal contractions should be performed with an exhalation so that intra-abdominal pressure is minimized. 5 repetition without hold

- Week 2: Correction exercise for diastasis recti-Head lift and head lift with pelvic tilt : 5 reps with 5sec hold

- Week 3: Correction exercise for diastasis recti-Head lift and head lift with pelvic tilt. Stabilization exercise for trunk and abdomen: Basic lumbar stabilization with progressive limb-loading exercise for abdominals. Procedure: Patient position hook lying. Begin exercise with drawing in maneuver for 5sec hold to activate core muscles. Determine level at which patient can maintain pressure constant (stable pelvis) while performing either A, B, or C limb load activity. A- Lift bend leg 90 hip flexion. B- Slide heel to extend knee. C- lift straight leg to 45. 5 repetitions. Basic lumbar stabilization with progressive limb-loading exercise for trunk extensors: Procedure: Patient position quadruped. Patient assumes neutral spine in lumbar and cervical regions (keeping eyes focused toward floor or exercise mat), performs drawing-in maneuver for 5 sec, and moves extremities. Motions are repeated for 5 times. A- flexion of one upper extremity. B- Extend one lower extremity by sliding along the exercise mat.

• Week 4: Correction exercise for diastasis recti- Head lift and head lift with pelvic tilt: 10 reps with 10sec hold. Stabilization exercise- For abdominals: 10 reps, For trunk: A, B, C, D: 10 reps, C- extend one lower extremity by lifting it off the mat, D- flexing one upper extremity while extending contralateral lower extremity and alternate to opposite extremities. 5 repetitions.

Statistics

The analyzed data showed that it was not a normal distribution using Shapro -Wilk test hence Non parametric test-Wilcoxon sign rank test was performed to analyze the data within the groups. Unpaired T-test was used to analyze the data between the groups.

Result

Table no.1: Comparison of Diastasis recti between groups

Diastasis recti	Above umbilicus pre	Above umbilicus post	At umbilicus pre	At umbilicus post	Below umbilicus pre	Below umbilicus post
Group A	3.04+0.4643	0.235+0.3986	3.1+0.3482	0.295+0.4026	2.965+0.5088	0.035+0.1466
Group B	2.965+0.5088	0.365+0.4542	3.215+0.4988	0.41+0.4626	2.115+0.5461	0.1350+0.3397
P value	0.0059		0.9072		0.1124	

Interpretation: Comparison between the groups was done using Mann-Whitney U Test above umbilicus p value is 0.0059 which is very significant, at umbilicus p value is 0.9072 which is not significant, below umbilicus p value is 0.1124 which is not significant.

Table no.2: Abdominal Strength

Abdominal Strength	Pre-intervention	Post-intervention	P value
Group A	59.220+15.167	129.44+20.303	0.1670
Group B	61.860+19.314	129.02+21.457	

Interpretation: The abdominal strength of group A pre intervention mean is 59.220±15.167 and post intervention mean is 129.44±20.303 and group B pre intervention mean is 61.860±19.314 and post intervention mean is 129.02±21.457 with p value 0.1670 which is not significant.

Table No.3: MODI score

MODI score	Pre-intervention	Post-intervention	P value
Group A	57.160+7.723	16.400+3.929	0.0977
Group B	57.500+9.300	15.600+3.856	

Interpretation: MODI score of group A pre intervention mean is 57.160±7.723 and post intervention mean is 16.400±3.929 and group B pre intervention mean is 67.500±9.300 and post intervention mean is 15.600±3.856 with p value 0.0977 is not quite significant

Discussion

Post-partum is period following the childbirth or period after pregnancy.[1] Diastasis recti is a separation of rectus abdominis muscles in the midline at the linea alba. The condition of diastasis recti may produce musculoskeletal complaints, such as low back pain, it result of decreased ability of the abdominal musculature and thoracolumbar fascia to stabilize the pelvis and lumbar spine.[2]

This study was conducted to investigate the effect of kinesio taping for diastasis recti. In our study, women were divided into two equal group- Group A treated by kinesio taping on abdomen and exercise for diastasis recti and Group B treated by exercises for diastasis recti for 4 weeks.

In our study, the diastasis recti was assessed pre and post values with finger-width test. In finger-width test, we measured diastasis recti at three levels above umbilicus, at umbilicus and below umbilicus. The abdominal strength pre and post values was assessed with sphygmomanometer. The disability was assessed by Modified Oswestry Disability Index (MODI) score.

In our study, group A mean of age group is 24.22$\pm$3.338 and in group B mean of age group is 24.2$\pm$3.62. The mean of BMI in group A is 25.09$\pm$3.069 and in group B is 24.65$\pm$2.884 as shown in table no.1.

In group A the diastasis recti results shows that (Graph no.1) there is significant difference between pre and post treatment on all three levels. Kinesio taping techniques focused on improving circulation, muscle activation, proprioception, function and decrease pain. The pressure directed away from the belly of a muscle and towards the Golgi tendon organs which produces relaxation of the muscle, while pressure toward the muscle belly, from the region of the Golgi tendon organs strengthens it; pressure directed near the belly of the muscle, towards the muscle spindle weakens it and while pressure away from the spindle near the belly strengthens it.Our study also support with the study conducted by Mohamed A. Awad et.al. concluded that Kinesio taping was effective in reducing diastasis recti in postpartum women.[4] Kinesio taping can increase the effect of exercise by stimulating muscle facilitation. Acute and chronic effects of Kinesio taping on neuromuscular performance and muscle activation and function, taping should be planned for patients as part of a rehabilitation program or in combination with exercise programs. This is also support with the study done by Ceren Gursen et.al. stated that addiction of kinesio taping with exercises in the postpartum physiotherapy program provides greater benefit for abdominal recovery in women.[6] In group B the diastasis recti results shows that , there is significant difference in pre and post treatment on all three levels. Exercise helps to maintain tone, strength and control of the abdominal muscles, consequently reducing stress on the linea alba. The transversus abdominis muscle is the deepest abdominal muscle. It has strong fascia links with the rectus abdominis muscle and the linea alba. Exercise of the muscle draws the bellies of the rectus abdominis muscle together, also improves the integrity of the linea alba and increases fascial tension which allowing efficient load transference and torque production. Our study also support with the study conducted by D.R.Benjamin done on theeffects of exercise on diastasis of the rectus abdominis muscle in the antenatal and postnatal periods.[8]

All corrective exercises had been in form of pulling in an abdominal muscles. Abdominal exercises can help to bring the left and right sides of rectus abdominis muscle, it will not cause extra stress on stomach or back. Abdominal muscle strengthening exercises continue to recommended during the postpartum period, particularly to reduce inter recti distance.

To obtain improvement of muscle strength following abdominal exercises via adoptive changes in the muscle caused by exercises as metabolic capabilities of the muscle are progressively overloaded. The muscle which is contractile tissue become stronger which is result of hypertrophy of muscle fibers and it increased recruitment of its motor unit. According to strengthening core control muscle of the abdominal region in postnatal period is very important as it help in creating a muscular corset to support the spine. This is also support the previous study done by Sanjeevani Khandale and Deepali Hande concluded that abdominal exercises are very effective in reducing diastasis recti in early postpartum women and inter recti distance.[9]

The result of abdominal muscle strength shows that, there is significant difference in values of pre and post treatment in group A and B. There is more improvement of abdominal muscle strength in group A women. The kinesio tape helps to correcting muscle function by strengthening weakened muscles and improving circulation of blood and lymph by eliminating tissue fluid beneath the skin by moving the muscle, decreasing pain through neurological suppression and helping to return

the function of fascia and muscle.This is also support to the previous study done by Mohamed A. Awad et.al. concluded that Kinesio taping was effective in reducing diastasis recti in postpartum women.[4]

Bycontracting the abdominal muscles makes it possible to reduce intra-abdominal pressure while exercising. It causes improvement of muscle strength and decreased rectus and increased intra-abdominal pressure which contributes to mechanical spine stability through the co activation of trunk flexors and extensors musculature. As abdominal muscle contract increased pressure and it converts the abdomen into rigid cylinder that increased stability of spine, improves abdominal strength. This is also support the previous study done by Sanjeevani Khandale and Deepali Hande concluded that abdominal exercises are very effective in reducing diastasis recti in early postpartum women and inter recti distance.[9]

The results of Modified Oswestry Disability Index (MODI) score shows the significant difference between the pre and post treatment in both group A and B. But there is more reduction of score in group A than B. The trunk stabilization exercises are aimed at improving the neuromuscular control, strength, and endurance of the muscles that are central to maintaining the dynamic spinal and trunk stability. It includes several groups of muscles particularly targeted the transversus abdominis and lumbar multifidi, but also other paraspinal, abdominal muscles. Thestabilization exercises may be useful in reducing pain and disability for all patients with nonspecific low back pain. Our study also support with the previous study done by Hye Jin Moon et.al. concluded that lumbar stabilization and dynamic strengthening exercise strengthened the lumbar extensors and reduced low back pain.[10]

Our study shows that the kinesio taping and exercise combine therapy is more effective than only exercise therapy in post-partum women. According to the Mann-Whitney test the difference between the pre and post values of group A and B above umbilicus level p value is 0.0059 which is very significant so the study shows that kinesio taping and exercises are effective for improving diastasis recti above umbilicus level. At umbilicus level p value is 0.9072 which is not significant and below umbilicus p value is 0.1124 which is not significant. The difference between the pre and post values of group A and B of abdominal strength p value is 0.1670 which is not significant.So study shows that for diastasis recti at umbilicus level, below umbilicus level the duration of intervention may be more. The difference between the pre and post values of group A and B of MODI score p value is 0.0977 which is not quite significant this signifies the exercises are effective for improving disability in post-partum women.

Conclusion

Study concluded that effect of kinesio taping and exercise on diastasis recti are more effective than only exercises in post-partum women.

Ethical Clearance- Taken from Institutional Ethical committee

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Conflict of Interest - NIL.

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