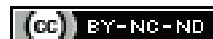


# Efficacy of Kinesio Taping among Females with Postpartum Low Back Pain- A Quasi-experimental Study

PRIYANKA RISHI<sup>1</sup>, JOGINDER YADAV<sup>2</sup>, POOJA ANAND<sup>3</sup>, BINDOO YADAV<sup>4</sup>

## ABSTRACT

**Introduction:** Low Back Pain (LBP) is considered to be the most salient feature during the postpartum period. The incidence of postpartum symptoms peculiarly back pain varies from women to women with vanishing of symptoms in over 60% in two days postpartum to as high as 82% at 18 months.

**Aim:** To explore the efficacy of kinesio tape on pain and Inter-Recti Distance (IRD) in women with Postpartum LBP.

**Materials and Methods:** A quasi-experimental study was conducted at SGT Medical Hospital and Research Institute, Gurugram, Haryana, India in Physiotherapy Outpatient Department (OPD) and Obstetrics and Gynaecology OPD of SGT Hospital. The data was collected from July 2019 to August 2020. Participants were randomly assigned to either the experimental group (group A) or control group (group B). Group A that performed combined kinesio taping along with exercises and hot pack five

times/week for six week and group B that followed conventional treatment that included exercises and hot pack. Pain and IRD was measured and analysed using Independent t-test at the baseline, end of 3<sup>rd</sup> week and at the end of 6<sup>th</sup> week. Independent t-test was used to compare the demographic characteristics as well as baseline criterion measures between both the groups.

**Results:** Significant improvement in pain scores (mean value of 13.75 at baseline to 3.75 at end of 6<sup>th</sup> week ) and IRD scores (mean value of 28.37 at baseline to 27.38 at last day of 6<sup>th</sup> week) were observed in group A that received kinesio taping along with conventional treatment in comparison to group B.

**Conclusion:** Group A showed significant improvement in IRD and pain parameters indicating improvement in LBP in postpartum women. Therefore, kinesio taping in combination with exercises may be incorporated in the management programs of the women suffering from postpartum LBP.

**Keywords:** Digital nylon calliper and rolland morris scale, Inter-rectus distance, Kinesio tape

## INTRODUCTION

Approximately, 30-78% of women experiences Low Back Pain (LBP) [1,2], which was considered a very common musculoskeletal problem during pregnancy and the declining of LBP postdelivery is a slow and incomplete process [3]. In spite of its prevalence, the LBP is often considered as a normal phenomenon and this negligence can lead to series of problems ranging from physical inactivity, sleep deprivation which results in a higher incidence of obstetric complications [4]. Postpartum LBP in relation to pregnancy is a notable health problem which affects a larger number of women globally [5]. The LBP in the postpartum usually starts after delivery and may continue till one year [6]. Numerous studies have been done on the pathophysiology and epidemiology of LBP in pregnancy but still there is much obscurity in regard the definition and cause of LBP during and post pregnancy [7,8].

However, it is concluded that postpartum back pain can be the result of increase of weight during the pregnancy which leads to biomechanical changes like changing the centre of gravity, disturbance in the posture and development of lordosis [9]. Musculoskeletal system undergo tremendous change anatomically and physiologically as there is increase in the secretion of the relaxing hormone which leads to increase laxity of joints and leads to biomechanical change in the musculoskeletal system [10]. Increase in the IRD which leads to a common condition called Diastasis Recti in the pregnant and postpartum population is seen to effects approximately 60% of postpartum women [11-13]. Diastasis Recti do not subside in the early postpartum period and this was reported by Fernandes da Mota P et al., that around 52% of women experience Diastasis Recti Abdominis (DRA) at eight weeks postpartum and around 39% at six months of postpartum [14].

Although there is conflict in the literature on whether increase in the IRD is associated with the LBP or pelvic floor disorders [15] but still

the experience from the clinical studies suggest that interventions involving exercises and kinesio tape may lead to improvement and decreasing distance IRD but there is no definite evidence to suggest its effectiveness. A systemic review on exercises and DRA during the ante and postnatal period found there is dearth of evidence in this area and suggested use of non invasive methods like kinesio taping as a strategy for management of LBP among postpartum women [16].

Limited literature and awareness is seen among women affected with Diastasis recti leading to increased IRD which makes them ignore the consequences associated with this, making it one of the causes for LBP in postpartum period. This brings the attention to the need to address the problem faced by the women in postpartum period and through this study it was hypothesised that a better treatment protocol could help women with postpartum back pain and lead a better quality of life as there is dearth of evidence of the management strategies in treating back pain and IRD. So, the aim of the present study targeted at finding out the effectiveness of kinesio taping in improving pain and IRD in women with postpartum LBP.

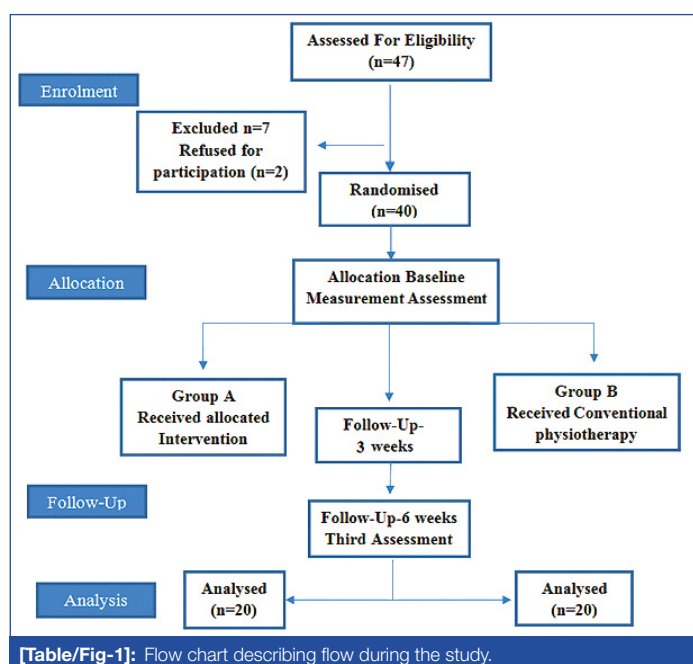
## MATERIALS AND METHODS

A quasi-experimental study was conducted at SGT Medical Hospital and Research Institute, Gurugram, Haryana, India. All procedures performed in the study were in accordance with the ethical standards of the Ethical Research Committee (Ref no- SGTU/FOP/2019/72) (Faculty of Physiotherapy, SGT University) and followed the 1964 Helsinki declaration of ethical consideration. The subjects were explained about the complete procedure of the treatment program and written informed consent was obtained from all the subjects. The study was conducted in the Physiotherapy OPD and Obstetrics and Gynaecology OPD of SGT hospital. The data was collected from July 2019 to August 2020. Subjects complaining of LBP from last three months were recruited.

**Inclusion criteria:** Subjects with age group of 20-35 years and 6-12 months postpartum, experiencing LBP from last three months and presence of IRD of minimum 9 mm at 2 cm below umbilicus, having normal vaginal delivery and singleton pregnancy were included in the study.

**Exclusion criteria:** Subjects who reported the history of any previous surgeries and presence of any vertebral anomaly and inability to perform exercises were excluded from the study.

Subjects who fulfilled inclusion and exclusion criteria were divided into two groups by simple random allocation method i.e., Group A (experimental group) included 20 subjects who received the kinesio taping on the abdominal muscles with the conventional physiotherapy. Group B (control group) included 20 subjects who received the conventional physiotherapy [Table/Fig-1]. Data was taken through Rolland Morris Disability Questionnaire for pain [17] and Digital Nylon Calliper (science ware Vernier Calliper) for IRD.



## Procedure

Subjects in group A received treatment for six weeks which included taping the abdominal muscles. Kinesiology tape (3×3×2.1 inches; 3.2 Ounces Manufacturer: AZSPORT) was applied first to the abdominal muscles which was then followed by the abdominal exercises. Before starting the treatment session, the abdominal area was cleaned with alcohol to clean skin before tape application so that skin is freed from oils and lotions. Tape was applied using I band with a tension of 50% with the subject in supine position. Ten minutes rest was given after the tape application for allowing the tape to gain full adhesive strength then performed the abdominal exercises which included isometric abdominal contractions and bridging along with the hot packs. The tape was applied for three days and then removed for one day and reapplied for an additional three days. The treatment protocol took average of 40 minutes.

Subjects in group B received conventional physiotherapy which included isometric abdominal contractions and bridging along with the hot packs. Each exercise took 15 minutes for completions with one minute rest between the exercises. Hot pack was applied for 10 minutes. The data was collected at the baseline and the last day of third week and last day of sixth week using Rolland Morris questionnaire [17] (it is a 24-item based questionnaire which assess normal activities for daily living which is affected by pain and leading towards disability). The participants were asked to choose and tick the item which they found difficult to perform due to pain by LBP and scoring was done with 0 as no pain and 1 with pain and vernier calliper.

## STATISTICAL ANALYSIS

Data was analysed using the Statistical Package for the Social Sciences (SPSS) version 22.0 (SPSS Inc., Chicago, IL, USA) for statistical analysis and result was calculated. Independent t-test was used to compare the demographic characteristics as well as baseline criterion measures between both the groups. Also, to investigate the between group change in outcome measures.

## RESULTS

[Table/Fig-2] shows the mean and SD of age (in years) and Body Mass Index (BMI) of total subjects included in the present study were 26.78±3.764 years and 27.75±3.008 kg/m<sup>2</sup>, respectively.

Demographic	Group A	Group B	Total
	Mean±SD	Mean±SD	Mean±SD
Age (in years)	27±2.962	26.57±4.500	26.78±3.764
BMI (kg/m <sup>2</sup> )	22.58±3.219	22.91±2.854	27.75±3.008

**[Table/Fig-2]:** Mean and SD of age and BMI of the subjects included in the study in the different interventional group.

The mean and SD of pain score on preintervention, three weeks after intervention and six weeks after intervention for group A and group B is shown in [Table/Fig-3]. Group A had more significant improvement than Group B [Table/Fig-3].

Pain evaluation	Group A	Group B	t value	p-value
	Mean±SD	Mean±SD		
Preintervention	13.75±1.916	14.90±2.532	-1.620	0.114
3 weeks after intervention	10.50±1.878	12.05±2.373	-2.29	0.028*
6 weeks after intervention	3.75±0.786	9.90±1.971	-12.962	0.001**

**[Table/Fig-3]:** Mean and SD of pain scores at preintervention, three weeks after intervention and six weeks after intervention of the subjects of group A and group B. \*Significant; \*\*Highly Significant

The mean and SD of IRD on preintervention, three weeks after intervention and six weeks after intervention for group A and group B is shown in [Table/Fig-4]. An equal variance t-test reveals high statistical difference between the mean values of IRD postintervention i.e., on 6<sup>th</sup> week between group A and group B [Table/Fig-4].

IRD evaluation	Group A	Group B	t value	p-value
	Mean±SD	Mean±SD		
Preintervention	28.37±0.802	28.56±0.824	-0.739	0.465
3 weeks after intervention	28.16±0.827	28.55±0.825	-1.498	0.142
6 weeks after intervention	27.38±1.01	28.52±0.823	-3.896	0.001**

**[Table/Fig-4]:** Mean and SD of IRD scores at preintervention, three weeks after intervention and six weeks after intervention of the subjects of group A and group B. Independent t-test was used; \*\*Highly Significant

[Table/Fig-5] shows the comparison of mean value of pain and IRD evaluation scores at preintervention, 3<sup>rd</sup> week of intervention and 6<sup>th</sup> week after intervention within group A and group B. For group A, the t-value at 95% level of significance of pre vs 3<sup>rd</sup> week, pre vs 6<sup>th</sup> week and 3<sup>rd</sup> week vs 6<sup>th</sup> week was 32.716, 21.269 and 14.553, respectively which reveals that there was significant improvement in pain of an individual after the administration of an intervention. For group B, the t-value at 95% level of significance of pre vs 3<sup>rd</sup> week, pre vs 6<sup>th</sup> week and 3<sup>rd</sup> week vs 6<sup>th</sup> week was 17.105, 15.411 and 7.130, respectively which also shows significant improvement in pain of the subjects.

For group A, the t-value at 95% level of significance of pre vs 3<sup>rd</sup> week, pre vs 6<sup>th</sup> week and 3<sup>rd</sup> week vs 6<sup>th</sup> week was 8.208, 8.491 and 6.558, respectively which reveals that there was significant improvement in IRD of an individual after the administration of an intervention. For group B, the t-value at 95% level of significance of pre vs 3<sup>rd</sup> week, pre vs 6<sup>th</sup> week and 3<sup>rd</sup> week vs 6<sup>th</sup> week was 7.373, 10.823 and 7.285, respectively which also shows significant improvement in IRD of the subjects [Table/Fig-5].

Group	Assessment	Pain evaluation		IRD evaluation	
		t value	p-value	t value	p-value
Group A	Pre vs 3 weeks	32.716	0.001	8.208	0.001**
	Pre vs 6 weeks	21.269	0.001	8.491	0.001**
	3 weeks vs 6 weeks	14.553	0.001	6.558	0.001**
Group B	Pre vs 3 weeks	17.105	0.001	7.373	0.001**
	Pre vs 6 weeks	15.411	0.001	10.823	0.001**
	3 Wks vs 6 weeks	7.130	0.001	7.285	0.001**

**[Table/Fig-5]:** Comparison of t value and p-value of different parameters at preintervention, three weeks after intervention and six weeks after intervention within group A and group B.

\*\*Highly Significant

## DISCUSSION

The study was designed to explore effect of kinesio taping on pain and IRD among females with postpartum back pain and to our knowledge there is limited Randomised Control Trials (RCT) investigating the role of kinesio tape in IRD leading to diastasis recti. Within the group analysis also showed improved but significant improvement was observed in between the groups and also there was no side-effects reported during this six week of duration. The intensity of pain and IRD showed improvement over the duration of the study in experimental group receiving kinesio tape along with the conventional physiotherapy. The mean and SD at preintervention, 3 weeks after intervention and 6 weeks after intervention for group A for pain showed improvement from  $13.75 \pm 1.916$ ,  $10.50 \pm 1.878$  upto  $3.75 \pm 0.786$ , respectively whereas in group B, the mean and SD value of pain showed less improvement from  $14.90 \pm 2.532$ ,  $12.05 \pm 2.373$  and  $9.90 \pm 1.971$  at preintervention, three weeks after intervention and six weeks after intervention, respectively. The result of the study was in accordance with Sabbour A and Omar H who concluded that kinesio tape along with pelvic tilting exercises is an effective treatment of back pain during late pregnancy [18].

Moreover, it was also stated by another study by Hwang G and Lee J that continuous application of kinesio tape around the trunk may act as an additional treatment method for acute LBP [19]. The result of the current study can be explained by the physiology it adopts by reducing acute or chronic spasm in the muscles and pain by supporting fascia and aligning the tissues in the desired position which inturn increases the stimulation of the mechano receptors to either activate or limit the movement, lifting the skin over the fascia and removes pressure over the lymphatic channels and removes exudates [20]. However, the result of the study was also in accordance with the study by Mohamed E et al., who stated that kinesio tape along with exercise are important modalities for treating scoliosis with decrease need for brace [21]. The significant improvement in the postpartum back pain can be summarised as decreasing pain sensation through improving lymphatic and blood circulation and also stimulating the proprioceptors, normalising the function of muscle and support of ligaments, which are important aspects in the muscle tone and improving postural sense thus reducing pain [20]. There is also dearth of studies which could find the association of IRD to LBP and limited literature present to find out the effective protocol for treating it.

In this study, the effectiveness of a novel intervention in women with increased IRD was assessed although there has been only limited research on studying the combined effects of kinesio and exercise in reducing IRD. The major concern with the increase in IRD which leads to Diastasis Recti is unawareness among many women and this was seen by Rajkowska N and Szumilewicz A research in which it was stated that a large proportion of women did not knew the problems caused by increased in the IRD leading to Diastasis Recti [22]. The mean and SD at preintervention, three weeks after intervention and six weeks after intervention for group A was improved from  $28.37 \pm 0.802$ ,  $28.16 \pm 0.827$  to  $27.38 \pm 1.01$ , respectively. In group B, the mean and SD value of IRD was  $28.56 \pm 0.824$ ,  $28.55 \pm 0.825$  and

$28.52 \pm 0.823$  at preintervention, three weeks after intervention and six weeks after intervention, respectively.

The result of the study was in accordance with the study conducted by Bobowik and Dabek A which they stated that the program consisting of exercises, education and kinesio tape was effective in 95% of the women in the exercise group ( $p < 0.0001$ ) in the postpartum period [23]. Ng Hung Shin PB et al., in their study found the effect of elevation of head with the tension created on the abdominal and pelvic floor muscles on the IRD of women who exercised with the head elevated and found out that the diastasis was smaller by as much as 15% [24]. This led to the conclusion that proper muscle tone of the pelvic floor and Transverse Abdominis (TrA) reduces the size of the diastasis of the abdominal muscles [24].

## Limitation(s)

The sample size of the study was small and there was no follow-up done to keep record of the sustainability of the treatment.

## CONCLUSION(S)

Present results demonstrated that kinesio taping improved pain and IRD in women with postpartum LBP indicating increased facilitation of the abdominal muscles and thus kinesio taping along with abdominal exercises might act as an effective exercise protocol in its management. This study will help clinicians in designing exercise training protocols for women suffering from postpartum LBP and Diastasis Recti. However, there is need for more studies to investigate the effect of Kinesio Taping on a larger sample to validate the current findings.

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