



Original Article

Association of Diastasis Recti with Lumbopelvic Pain in Postpartum; A Cross-sectional Study

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ABSTRACT

Background: Diastasis recti abdominis is an impairment that is characterized by the separation of the rectus abdominis muscles along the linea alba. There is an increased distance between the two recti muscles which is termed “inter-recti distance”, that might exist congenitally, but usually develops during pregnancy and in the initial postpartum period. **Objective:** To determine the association between diastasis rectus abdominis and lumbopelvic pain in postpartum females. **Methods:** In this cross-sectional study, the data was collected from various public and private hospitals in Lahore, Pakistan for a six-month duration. Convenient sampling was used to include 97 postpartum females aged between 25 and 35 years. Those postpartum females were excluded who had any history of auto-immune disease, cerebral disease or any spinal issue. After getting their consent, the postpartum females were asked about their age and mode of delivery and they filled self-structured assessment questionnaire. The body mass index of patients was calculated and Pearson’s correlation was applied to find out the association between lumbopelvic pain and diastasis recti abdominis. **Results:** The occurrence of diastasis recti abdominis was 81(83.5%) out of 97 postpartum females and their inter-rectus distance was greater than 16mm at 2cm below the umbilicus. A significant association was found between lumbopelvic pain and diastasis recti abdominis in postpartum females ($p < 0.05$). **Conclusion:** This study concluded that diastasis recti abdominis is significantly associated with lumbopelvic pain in postpartum females. Out of 97 postpartum females who were included in this study 81 were reported to have diastasis recti abdominis and out of these 81 postpartum females 47 were reported to have lumbopelvic pain in their postpartum period.

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INTRODUCTION

The excessive broadening and separation between the two bellies of the rectus abdominis muscle are termed diastasis recti abdominis (DRA)^{1,2} that has been reported to be associated with pregnancy, but it affects both postmenopausal women^{3,4} and also men.^{5,6} While searching on PubMed publicized only a few studies on the prevalence of DRA during pregnancy and in the postpartum period.^{4,7-9} As yet, there is inadequate knowledge about risk factors associated with DRA, but factors such as elderly age, multiparity, cesarean section, weight gain, multiple pregnancies, high birth weight, ethnicity and child care have been anticipated.^{4,10}

There are very less studies showing and reporting the risk factors associated with DRA within the time of more than six months postpartum period. There is very less knowledge of the consequences of DRA. However, it has been claimed that DRA might change the posture of pregnant and post-partum women and give more strain to the back reducing functioning and strength, which leads to low back pain and pain in the lumbopelvic region.¹¹⁻¹³ Various changes occur in the body of a woman while she is pregnant and even after she gives birth to her child. These changes might affect the woman's physical as well as mental health.¹⁴⁻¹⁶

The four muscles which make up the anterior abdominal wall are connected anatomically. These muscle fibers are arranged horizontally, vertically and obliquely.¹⁷ While the woman is pregnant, the size of her uterus increases, and there is also an increase in her weight which affects the functioning and structure of her trunk muscles. While the woman is pregnant, her thoracic cavity increases in its inferior diameter, which in turn affects the attachments of the abdominal muscles. The muscles elongate lengthwise and thus increasing the distance between lateral and anterior attachments of the muscles. The majority of

women during their pregnancy, their rectus abdominis muscles move laterally thus increasing their inter recti distance which might also be increased in their instantaneous post-delivery period.^{7,16} The entire gestation period results in a lot of anatomical and physiological changes to the woman's body. Amongst them are the increase in the width and the girth of the abdominal wall which stretches roughly 115%. The DRA influences a huge quantity of women throughout their pregnancies and post-partum, with an occurrence rate of 32.6%.¹⁸ The rate of incidence of DRA is sixty-eight percent in postnatal women, twenty-seven to hundred percent in pregnant women and 30% in late pregnancies.¹⁰

The lumbar and pelvic regions play a very crucial role in the proper functioning of a body's proper musculoskeletal system. The changes which take place in the distance between the two rectus abdominis during pregnancy are linked to poor performance of the abdominal muscles. The abdominal region includes the bone framework of the pelvis, the pelvic floor muscles, the diaphragm and the abdominal muscles.¹⁹ To modulate the movements taking place at the pelvis against opposition and resistance, the abdominal muscles are used.²⁰ Adjustments and alterations in biomechanics in the functioning and the structure of the abdominal wall result in increased inter-recti distance (IRD).

Many studies have shown that this increase in the distance in both the recti after childbirth harms the abdominal muscles. However, no study has been conducted by far showing an association between increased IRD and reduction in body functioning.²¹ Creating awareness among the population regarding the treatment and rehabilitation of the enlarged inter-recti distance is of excessive importance among healthcare professionals. If this condition prevails and is untreated it might result in weakness if the muscles of the trunk,

poor functioning, incontinence of the bowel and bladder, herniation and weakness of pelvic floor muscles, pain in the lumbar and pelvic region, lumbopelvic pain (LPP) and might cause complications in the subsequent pregnancy.²² It is also worth mentioning here that the DRA muscle is not always associated with dysfunctions of the pelvis.²³ A lot of preceding studies have shown that this enhanced inter-recti distance is one of the communal issues in women after they give birth to a child that might affect their activities of daily living in various ways.

In Pakistan, a very high prevalence was observed for increased IRD in females.²² This current study aimed at finding out whether there was a significant association between DRA with some or all of the dependent measures and dysfunctions for lumbopelvic pain in postpartum females.

This study also aimed to investigate reporting of LPP in postpartum women with or without DRA to find out how much these two variables are associated with one another. As Pakistan is a developing country with not enough awareness about the symptoms, negative consequences, and risk factors of DRA and its preventive measures and exercises during pregnancy and postpartum. This study highly recommends that future researchers carry out controlled trials that might focus on risk factors and their possible consequences and effects of abdominal training exercises to prevent and treat this condition during pregnancy and in the postpartum period.

Adding more to this, there is inadequate access to the resources and health care professionals who might help pregnant and post-partum women who already suffering from psychological and physical symptoms resulting from increased IRD i.e. LPP during pregnancy and postpartum. So, this study worked on finding out the association between these two variables. There was a dire need to fill this gap, this study was designed to find the association of DRA with LPP in postpartum females so that this might be deliberated and

numerous preventive exercises and treatment plans can be formulated.

METHODS

This current study is a cross-sectional study that was conducted after approval from the ethical committee of the University. Using the epi-tool available online, the sample size was calculated to be 97 with a confidence level of 95%, an anticipated population of 49.6%, absolute precision of 10%. The data was collected from various public and private sector hospitals in Lahore, Pakistan. Consent from the management of each hospital was gained before beginning the data collection process. Postpartum females aged between 25 and 35 years were included in this study.

Those postpartum females were excluded who had any history of auto-immune disease, cerebral disease or any spinal issue. Every female who was to be part of this study was given all the information about this study and written consent was taken from them. All the relevant information was kept confidential and the postpartum females were assured that there is no detrimental effect of this study. The postpartum females who were recruited in this study were also informed that they are free to leave this study whenever they want during the research. Every female included was given a self-structured assessment questionnaire, in which they were asked about their socio-economic status, age and mode of delivery; C-section or vaginal birth.

Every female's IRD was measured by the physiotherapist manually using the finger method.²⁴ The cut-off value of DRA was set at IRD greater than 16 mm at 2cm below the umbilicus. One finger width or gap was considered as normal inter-diastasis distance while diastasis recti were diagnosed when a 2-fingers gap or width was reported.²⁴ The presence or absence of lumbopelvic pain was asked to find out whether postpartum females with DRA have more complaints of lumbopelvic pain than a postpartum woman without DRA. The body mass index (BMI)

was calculated by measuring each postpartum's female's weight and height.²⁵ Version 23 of SPSS was used to analyze the data. Pearson's correlation was applied to find out the association between DRA and LPP in postpartum females and also between LPP and various other factors such as age group, education, residence (rural or urban), vaginal birth, the performance of exercise regularly and BMI. The LPP was taken as the outcome variable while all the other variables were taken as predictor variables.

RESULTS

In the current study, the average age of postpartum females was 32 years, ranging between 15 to 45 years (Table I). The mean BMI was 23 kg/m² (Figure I). The waist circumference

ranged between 71 and 116 cm. All the females included in this study had given birth to at least one child. Out of 97 post-partum females who were included in this study, 81 (83.5%) had DRA. The cut-off value of DRA was set at IRD greater than 16 mm at 2cm below the umbilicus. One finger width or gap was considered as normal inter-diastasis distance while diastasis recti were diagnosed when two finger gap or width was reported.

Out of 97 postpartum females, 47 (48.45%) in Table- II, postpartum females who had DRA also reported the presence of LPP. A correlation test was applied to find out the association between LPP and DRA and it came out to be p<0.05, which showed a significant association between the LPP and DRA in postpartum females (Table III).

Table I: Age Groups of Postpartum Females

Age Groups (years)	Frequency	Percentage (%)
15-25	36	37.1
26-35	32	33.0
36-45	29	29.9
Total	97	100

Table II: Presence or Absence of Lumbopelvic Pain in Postpartum Females

Presence or Absence of Lumbo- Pelvic Pain	Frequency	Percentage (%)
Yes	47	48.5
No	50	51.5
Total	97	100

Table III: Association between the Lumbopelvic Pain and Diastasis Recti Abdominis in postpartum females

Variables	Correlation	Lumbopelvic Pain	Diastasis Recti Abdominis
Lumbo Pelvic Pain	Pearson Correlation	1	.431**
	Sig. (2- tailed)		.000
Diastasis Recti Abdominis	N	97	97
	Pearson Correlation	.431**	1
	Sig. (2- tailed)	.000	
	N	97	97

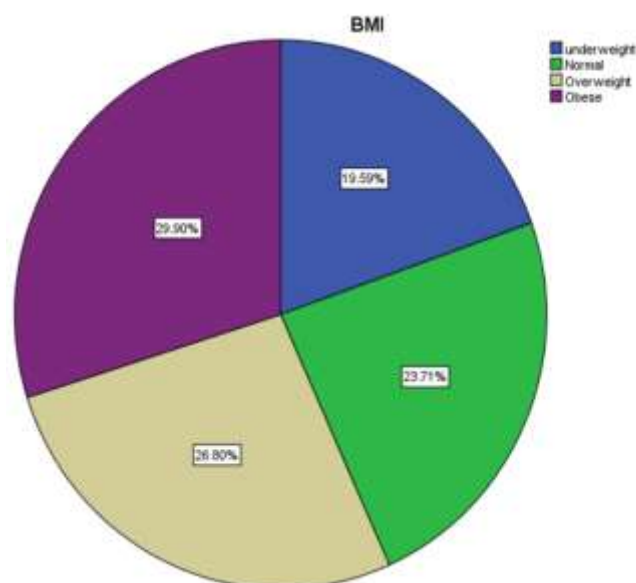


Figure I: Body Mass Index in Postpartum Females

DISCUSSION

The postpartum women with DRA were more likely to report lumbopelvic pain than postpartum females without DRA. Anwar A and coworkers also reported that lumbopelvic pain is one of the strong predictors attributed to the cause of disability in postpartum females who report almost 2-finger IRD after they give birth.¹⁶ Their study added more information regarding psychological and physical elements which were associated with impairments or disabilities in post-partum females resulting from symptoms from increased IRD. Even though the postpartum females were evaluated with all the symptoms from an increased IRD, the LPP was one of the strongest predictors of impairment and disability in postpartum females.¹⁶ This study's findings are similar to the current study.

A study which was conducted by MA Parker et al. aimed at investigating the clinical hypothesis, that whether the presence of IRD was one of the causes of discomforts like Lumbopelvic pain. Their results concluded that postpartum females who had increased IRD reported having higher degrees of abdominal and LPP.²⁶ Their study coincides

well with our recent study which is showing an association between DRA and LPP in postpartum females. Dalal et al. also conducted a study and their purpose was to examine the clinical assumption that DRA, when left without treatment might leave women susceptible to LPP. It showed that the incidence of DRA was 83.33%. It concluded that postpartum females with DRA were most likely to have a greater degree of lumbopelvic pain.²⁷ Results of this study also coincided with this current study.

Rita E Deering conducted a study to find out the fatigability of the lumbar and pelvis stabilizing muscles in women who were 8 and 26 weeks postpartum. The dysfunction of muscles that stabilize the lumbar and pelvis after giving birth was examined. They concluded that postpartum females after giving birth demonstrated more dysfunctioning of muscles stabilizing the lumbar and pelvis.²⁸ This also positively correlated with our study.

Sara Aabroo et al. conducted a study that worked on finding out the frequency of DRA and LPP during pregnancy and also worked on

other factors associated with DRA concluding that 24% of women were suffering from slight or mild DRA while they were pregnant. They reported that the majority of the pregnant females were experiencing pain in the lumbar and pelvic regions. They also suggested that factors like a higher BMI, lifting activities, history of C-sections and LPP are associated with DRA.²⁹ Their findings agree with the finding of our current study.

Jorun Bakken et al. contraindicated with the results of this current study. Their study showed that there was no difference in lumbopelvic pain in a woman with or without DRA. They concluded that although the incidence of DRA was high both during pregnancy and after delivery, women with or without DRA testified the same level and amount of LPP, twelve months post-partum.¹² Thornton and coworkers reported a woman with twenty-three centimeters DRA with noticeable associated low back pain.³⁰ But this current study did not have any severe enough IRD representing to detect this association.

A study conducted by Spitznagle and coworkers was the only study that examined the association between DRA and numerous types of pelvic floor dysfunctions. They reported a relationship between DRA and stress urinary incontinence, fecal incontinence and pelvic organ prolapse which were not examined in the current study.⁴ Parker et al. conducted a study to find out whether DRA and LPP and dysfunctions are related to each other or not. This study did not add or record any information regarding the exercise habit of postpartum females.²⁶ There is a good chance that most of them would have participated in exercise during pregnancy or in their postpartum periods and this might have affected our results.

Pregnancy and postpartum-related lumbopelvic pain has been associated with DRA in this current study and our study findings are consistent with the results. A greater degree of Inter Recti Distance might influence everyday life. The limitations of this

study were time restraints and small sample size. Ethnicity, race and obesity, all might be associated with the occurrence and incidence of DRA, our results would have been further authenticated if these factors would have been in the screening.

CONCLUSION

This study concluded that lumbopelvic pain is associated with increased inter-recti distance after childbirth. This current study highlights that increased inter-distance recti and diastasis abdominis recti are linked with pain in the lumbar and pelvic region in postpartum females. The DRA is significantly associated with lumbopelvic pain and around half of postpartum females with diastasis abdominis recti were found to have lumbopelvic pain.

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.

Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.

Competing interests: None

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