



Original Article

Frequency of Diastasis Recti Abdominis in Pregnant Women of Third Trimester

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ABSTRACT

Background: Diastasis of recti abdominis has been defined as the separation of the bundles of muscles that are present lateral to the linea alba. It has been observed during pregnancy, postpartum and even in postmenopausal women. Literature shows us that a lot of work has been conducted on this subject in Western countries but Pakistan lacks this kind of authentic literature. **Objective:** This study aims to determine the frequency of Diastasis recti abdominis in pregnant women in their third trimester. **Methods:** This is an observational cross-sectional study. The sample of this study was n=169. Pregnant females in their third trimester with diastasis recti abdominis were recruited in this study. The finger width method was used to test the presence of diastasis recti abdominis. The data for this study was collected from the obstetric department of Jinnah, Fatima Memorial, General and Itifaq Hospitals, Lahore, Pakistan. A purposive sampling technique was used to recruit participants in this study. Data was analyzed using Statistical Package for Social Sciences 23. The quantitative variables were represented as mean and standard deviation. An alpha level of 0.05 was chosen as a significant level. **Results:** 52 pregnant females in their third trimester out of 169 were diagnosed with diastasis recti abdominis. The width of their muscle separation was recorded to be greater than 2 cm. The range of age for the recruited pregnant females in their third trimester was 18 years to 40 years. 110 pregnant females out of 169 were in the age range of 24 years to 32 years. It was also observed that not all the pregnant females recruited in this study had diastasis recti abdominis but 48.5% of the participants had lower back pain which was confirmed by finger width test. **Conclusion:** This study concludes that the frequency of diastasis recti abdominis in pregnant females in their third trimester is 30.8%. This study also concludes that Diastasis recti abdominis was common in pregnant females of age greater than 30 years. This study concludes that diastasis recti abdominis was more common in pregnant females who were not engaged in any sort of regular exercise.

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INTRODUCTION

Diastasis of rectus abdominis has been well demarcated as the separation of the bundles of muscles laterally to linea alba. This gap of separation might vary between a minute vertical gap of about 2 to 3 cm and 12 to 15 cm in length, 12 to 20 cm in width and can be seen to be extended almost through the entire length of the recti muscle. Diastasis rectus abdominis has been observed to occur during pregnancy, post-partum and even in post-menopausal women.¹⁻³ While a woman is pregnant, numerous hormonal changes occur in her body due to various reasons. Resting, progesterone levels and alterations in estrogen levels are accompanied by the growth of uterine muscle causing the muscle of the abdomen to stretch, which affects the rectus abdominis muscles primarily. In addition to these changes, it is common for pregnant females to have an anterior pelvis and lumbar hyperlordosis with the presence or without the presence of palpitations.

These very wonderful alterations during pregnancy are known to affect the insertion angle. The muscles of the abdomen and pelvis are also observed to affect the biomechanics of the posture of the body. These changes that occur in the body of the pregnant females might also cause the support of the organs of the pelvis and abdomen organs to be lost. Additionally, as the period of the pregnancy progresses, the stretch exerted on the abdominal muscles increases while there is a decrease in the force vector of these muscles and this might also cause a decrease in the contraction power of these muscles. Thus, the changes that occur in the biomechanics of the body of pregnant females and the stretching of these muscles facilitate the occurrence of diastasis of the rectus abdominis muscle.⁴ A study conducted by Thabet and co-workers reported the prevalence of diastasis recti abdominis to be about 6% to 100% in pregnant females in their third trimester and

about half of the women, 53% suffer through it immediately after delivering a child. This might be associated with the stress their body undergoes after giving birth to a child.⁵ The most commonly observed signs and symptoms are, pain in the lower back and poor posture and the most major symptom of the inflammation of diastasis recti abdominis is pus or an observable bulge in the stomach.^{5, 6} Previously conducted studies also report that the incidence of occurrence of diastasis recti abdominis and the size of diastasis recti abdominis in pregnant females who don't exercise is higher than those pregnant females who exercise.⁷ A large number of studies have been conducted to determine the potential risk factors for diastasis recti abdominis in females. Some of the identified potential risk factors for diastasis recti abdominis are, multilateralism, ethnicity, childcare responsibilities, cesarean sections, not being involved in regular exercises before pregnancy and after pregnancy, multiple pregnancies, an increased maternal age, weak strength of the muscles of the pelvic floor⁸, abnormal weight gain during pregnancy and an abnormally larger birth weight.^{3, 9}

Measuring the gap with palpation and the number of fingers that can fit between the rectus abdominis muscle separation is called the Finger Width palpation method. This method has been known to be the most widely used technique in clinical setups.¹⁰ Mota P and co-workers conducted a study to examine the criteria to validate and check the reliability of the finger width palpation method. They also compared this method with ultrasound imaging in healthy females.¹¹ No difference was found between ultrasound imaging and finger width palpation method when considering the experienced health professional, however, a significant difference was observed between the two procedures considering the non-experienced clinicians.⁹ Previously conducted studies did not explain

the incidence rate of diastasis recti abdominis in pregnant females who did not do any exercises before pregnancy in Pakistan. This study might add literature to fill this research gap in the literature. Diastasis recti abdominis has been observed to be common during the third trimester of the pregnancy. Previous evidence has shown that a lot of work has been conducted on this subject in European countries but very scarce literature is available on this subject considering the Pakistani population. Hence, finding out the frequency of diastasis recti abdominis in the third trimester of pregnancy of Pakistani females, will help Pakistani gynecologists and physiotherapists to help reduce the incidence of diastasis recti abdominis by encouraging exercise habits regularly during pregnancy and even the pre-natal tenure. Finding out the frequency of diastasis recti abdominis will aid in creating awareness among Pakistani females regarding this issue and help them avoid this condition through easy and natural remedies. This will also aid the health professionals in guiding the females to prevent this issue in the first place and to avoid the severity of this issue.

METHODS

This current study is an observational cross-sectional study. This study was approved by the ethical committee of the University of Health Sciences, Lahore. This study was completed after 3 months after the approval of its synopsis. The sample size of this was $n=169$ which was calculated by using the following formula:²

$$n = \frac{z^2 \times (1-p)}{e^2} \times \frac{1 + (z^2 \times (1-p))}{e^2} N$$

Here n is population size, e is margin of error (percentage in decimal form) 5% and z is z -score. The data was collected from the obstetric department of Jinnah Hospital, Lahore, Fatima Memorial Hospital Lahore and Iteffaq Hospital, Lahore, Pakistan. The

collection tool that was employed to include pregnant females in this study was the finger width method¹², which was used to test Diastasis Recti Abdominis in the third trimester of their pregnancy, pregnant females who were in their third trimester were recruited in this study using a purposive sampling technique. Pregnant females who were in their third trimester diagnosed with diastasis recti abdominis were included in this study.

Those pregnant females who had any other medical condition during their third trimester were excluded from our study. Before data collection, all the pregnant females were evaluated by gynecologists who fulfilled the inclusion criteria of this study and the gynecologist also aided in assessing the diagnosis of diastasis recti abdominis. Originally formal permission was taken from the authorities of the department and then written consent forms in Urdu and English were signed by every pregnant female who had diastasis recti abdominis in the third trimester recruited in our study. All the pregnant were assured that their anonymity and privacy would be maintained. Pregnant females who were voluntarily enthusiastic to participate in our study were encouraged. The entire process was explicitly explained to all the pregnant females. The frequency of diastasis recti abdominis in the third trimester of pregnancy was assessed by using the finger width method.¹² The width of muscle separation was measured in centimeters. The data was collected from them by interviewing the pregnant females with diastasis recti abdominis in the third trimester. The pregnant females who were recruited in this study were asked about their number of pregnancies, their gestation week, their number of children, the time they spent resting and how much time they spent doing regular exercise. The data was represented in the form of graphs and tables. The data was analyzed using Statistical

RESULTS

Figure I: Frequency of ages of pregnant females in the third trimester with Diastasis Recti Abdominis

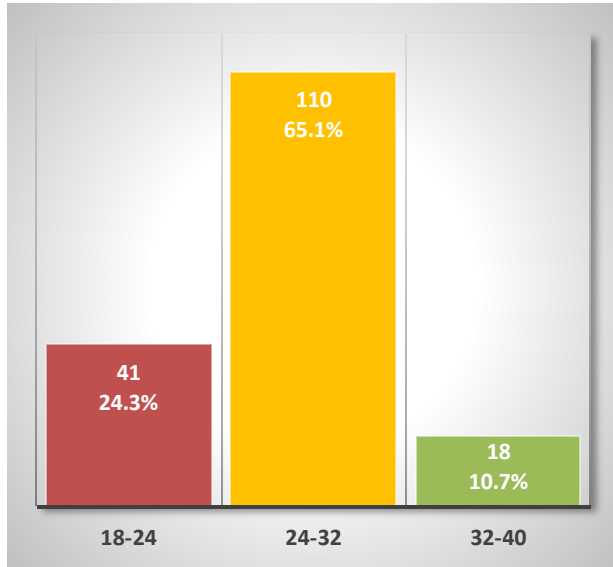


Figure II: Frequency of width of muscle separation in centimeters

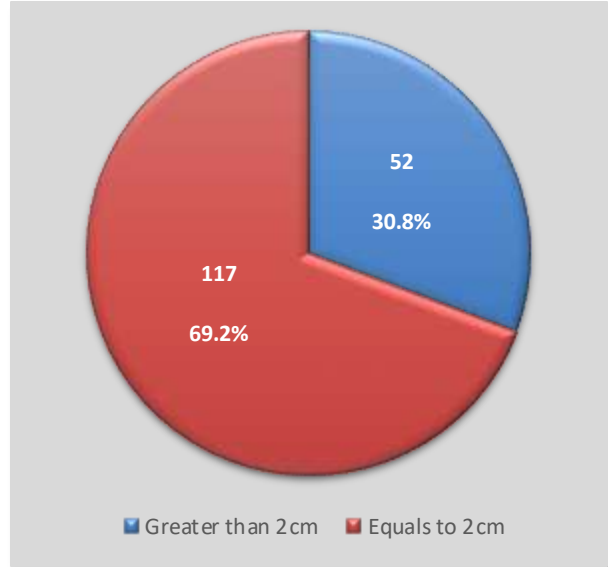
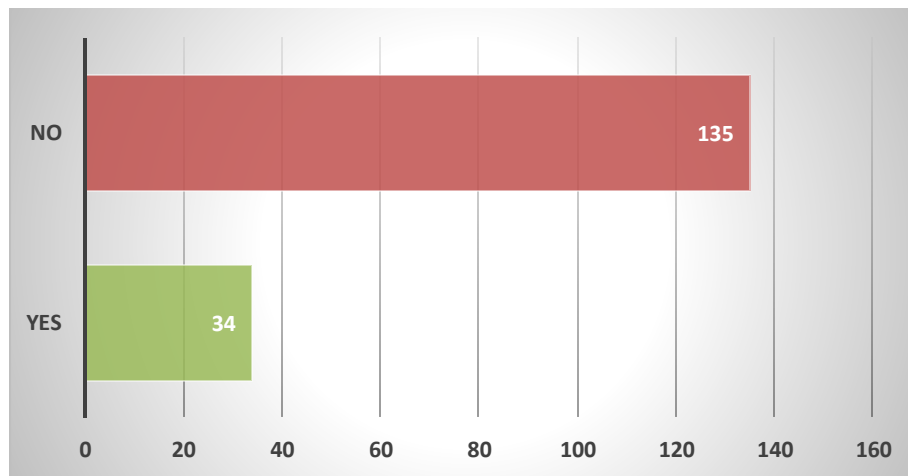


Figure III: Regular exercise in 3rd trimester



Package for Social Sciences version 23. The quantitative variables were represented as mean and standard deviation. An alpha level of 0.05 was chosen as a significant level.

DISCUSSION

This observational study examined 169 pregnant females in their 3rd trimester, 52 (30.7%) pregnant women in their third

trimester reported having the width separation of the muscle to be more than 2 cm. The major frequency of diastasis recti abdominis in pregnant females in the third trimester was in the age range of 28 to 31 years, 48.5% of the sample size falls in this age group. This current study evaluated the significant relationship ($p < 0.05$) between the increasing age of the women and their gestation week

with the occurrence of diastasis recti abdominis. A significant correlation was also observed between muscle separation and exercise width. The results of our current study showed the frequency of Diastasis recti abdominis was low as compared to other studies previously conducted in Brazil and Chicago which were 64% and 68%.^{13,14} This difference may be because of the difference in the tools employed for assessment of these studies, the difference between the cut-off values and the different locations along the linea alba to recognize the presence of diastasis recti abdominis. For example, the study which was conducted in Brazil showed a higher prevalence of Diastasis recti abdominis of 68%.¹³ This might be higher due to a larger sample size and a larger number of multiparous population recruited in their study.

Kaiyant Yaseen and co-workers¹⁵ conducted a study finding the prevalence of diastasis recti in pregnant women. Their study included pregnant women of all the trimester but our study focused only on pregnant women who were in their third trimester. The results of their study showed us that the prevalence of diastasis recti abdominis was very common during pregnancy. Their results showed a very higher percentage of 82% of pregnant women included in their study had diastasis recti during pregnancy. Contrary to their results our study showed a rather lesser frequency of diastasis recti abdominis maybe because our study focused only on the third trimester their study was more generally applicable to the entire tenure of the pregnancy. A previous study conducted by Biossonnault and co-workers showed a 27 percent frequency of diastasis recti abdominis in 2nd and 4th trimester of pregnancy.^{15, 16} Whereas our study showed only 30.7% percent of pregnant females in their third trimester to have noticeable muscle separation. Blackhawk and co-workers observed that the muscle bundle may remain separated during the postpartum

period.⁴ Our current study did not work on finding the frequency of diastasis recti abdominis in pregnant females in their post-partum stage either. Kaiyant Yaseen and coworkers¹⁵ also found an association between pain in the lower back and diastasis recti abdominis. Our study also showed the presence of lower back pain with diastasis recti. This study showed that 48.5% of the participants of this study had pain in the lower back which was confirmed by the finger width test. This agrees with the fact that diastasis recti abdominis contributes to the pain in the lower back, weakness of the muscles of the back and pelvis, uterine expansion, urinary incontinence and problems while breathing which ultimately results in difficulty in getting back to normal daily routine.^{6,15,17}

It is the need of the hour to create an awareness regarding diastasis recti abdominis and its rehabilitation. Bobowik and co-workers¹⁸ conducted a study implementing physiotherapy in females with diastasis recti abdominis. They didn't show any clear correlation between the width of the separation of the muscle and the age of the mother. ($p > 0.05$). Our study showed that the separation of muscle was above 2cm in pregnant females whose age was more than 30 years. They also concluded that unprompted reduction of the diastasis recti abdominis is very infrequent. Abayneh Alamer and co-workers determined the prevalence of diastasis recti abdominis and its associated factors in females in Tigray, Ethiopia.¹ Their study showed us that the prevalence of diastasis recti abdominis in pregnant and postpartum females was moderate. Our current study did not focus on post-partum females. They concluded that risk factors like parity, pain in the lumbar and pelvis, abdominal strengthening exercises and history of C-sections were associated with the occurrence of diastasis recti abdominis.² Our study recommends conducting future studies focusing on determining risk factors for

diastasis recti abdominis in Pakistani females so that more awareness can be generated among Pakistani females to prevent this condition and avoid its adverse effects of this condition in the future. The major objective of this study was to determine the frequency of diastasis recti abdominis in pregnant females who were in their third trimester and to create awareness among women regarding this issue and its complications. This study was conducted by physiotherapists and gynecologists themselves. Creating awareness regarding diastasis recti abdominis is very crucial otherwise it can bring a lot of serious complications caused by it. Since this study is focusing only on pregnant women in the third trimester future researchers are recommended to find the frequency of diastasis recti abdominis in women even before pregnancy, in other trimesters and post-delivery. The sample size of this study was also small if we consider the population of the entire Pakistan. More studies should be conducted considering a larger sample size and research to be conducted both in urban and rural areas of Pakistan.

CONCLUSION

This study concludes that the frequency of diastasis recti abdominis in pregnant females in their third trimester was quarterly. 52 out of 169 pregnant females recruited in this study in their third trimester were tested to have muscle separation of more than 2cm. This study also concludes that 48.5% of the participants in this study had pain in the lower back which was confirmed by a finger width test. This study also concludes that diastasis recti abdominis was observed to be more prevalent in pregnant females of age more than 30 years. This study proved to us that there is a relationship between Diastasis recti abdominis and regular exercise. This study also concludes that diastasis recti abdominis is more common in pregnant females who do not engage themselves in regular exercises.

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

Funding: No funding source was involved.

Authors' contributions: All authors read and approved the final manuscript.

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