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Prevalence of Low Back Pain in the immediate postpartum period with DRAM

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Abstract

Introduction: The DRAM is defined as the separation or spread of the muscle bundles along the linea alba. The occurrence of DRAM is more common in pregnancy and immediate puerperium. The condition is highly prevalent during the last trimester of pregnancy and in the postpartum period. DRAM reduces low back and pelvic stability resulting into low back and pelvic girdle pain. Unresolved DRA may compromise any of the functions of the abdominal wall including its role in posture, trunk stability, respiration, delivery of a fetus, trunk flexion, rotation, and side bending.

Objective: To find out the prevalence of low back pain among patients having diastasis of recti abdominis in the immediate postpartum period.

Methods: 100 postpartum women with DRAM of 2 cm or more on transabdominal ultrasound were included in this study. The interrectal distance was measured at 5cm above umbilicus, at 2cm above umbilicus, and 2cm below umbilicus. Low back if any, was measured on Numerical Pain Rating Scale (NPRS)

Results: The prevalence of Low back pain in patients with diastasis recti is 58%. The prevalence of low back pain is more in primiparous women that is 59.52% compared to multiparous women which is 56.52. The distance of separation, found maximum at the umbilicus was 77%.

Conclusion: This study concluded that low back pain is associated with DRAM and the prevalence of low back pain was found to be 58%.

Keywords: Diastasis Recti, Low Back Pain, Transabdominal Ultrasound

Introduction

The period after delivery is called puerperium or postpartum period, when changes caused by pregnancy and delivery return to the pre-pregnancy state. The postpartum period lasts 6 to 8 weeks and is classified as immediate (1 to 10 days after birth), late (from 11 to 45 days) and remote (more than 45 days)[1]. During pregnancy, hormonal changes caused by relaxin, progesterone and estrogen combined with uterine growth may cause stretching of the abdominal muscles[1], affecting mainly the rectus abdominis muscles. It is common during pregnancy to have anterior pelvic tilt with or without lumbar hyperlordosis[1-3]. These postural changes can affect the angle of insertion of the pelvic floor muscles as well as the abdominal muscles which in turn affects the

postural biomechanics. This creates a lack of the support of the pelvic-abdominal organs. As pregnancy progresses it causes the abdominal muscles to stretch, resulting in a loss in the force vector of these muscles, and thereby decrease in contraction strength[3-6]. These biomechanical changes and stretching of these muscles result into the appearance of diastasis of the rectus abdominis muscles (DRAM). The DRAM is defined as the separation or spread of the muscle bundles along the linea alba[4-8]. The occurrence of DRAM is more common in pregnancy and immediate puerperium[7]. The main predisposing factors being obesity, multiparity, fetal macrosomia, flaccid abdominal muscles, polyhydramnios and multiple pregnancies[8]. DRAM may be a temporary condition[5,6] or may remain throughout life[4,9,10]. The condition is highly prevalent during the last trimester of pregnancy[2,3] and in the postpartum period[4,5]

It is possible for DRAM to reduce low back and pelvic stability resulting into low back and pelvic girdle pain. It may be related to pelvic floor dysfunctions such as urinary incontinence, anal incontinence, and pelvic organ prolapse[6,10] Unresolved DRAM may compromise any of the functions of the abdominal wall including its role in posture, trunk stability, respiration, delivery of a fetus, trunk flexion, rotation, and side bending[11,12,13].

Low back pain may occur as a result of the incorrect posture and biomechanics attributed to abdominal muscle weakness[9,11,14]. Abdominal hernia, stress urinary incontinence, pelvic pain, and fecal incontinence can be additional complications[4,15]. It is essential that DRAM be diagnosed and treated to reduce its negative impact on function and quality of life.

The simplest way to evaluate DRAM is to measure the number of finger breadths between the medial edges of the muscles, but the use of specific equipment such as calipers has been recommended and its reliability has been established[8]. Transabdominal ultrasound is a gold standard when it comes to measuring DRAM[16]

Though it is known that DRAM is not a direct cause of discomfort or pain, but excessive distension may interfere with the abdominal muscles' ability to stabilize the trunk, generating greater predisposition to lumbar pain development[9,10]. As a result, obstetric physical therapists are working on adapting optimal measures of treating DRAM in pregnant and postpartum patients.

Physical therapy has been identified in the research as the one of the chosen conservative treatment for DRAM in peripartum and postpartum women. Thus, it is essential to investigate DRAM along with low back pain among postpartum women to establish DRAM references, define the patient profile and thus further to develop prevention and treatment strategies during pregnancy and puerperium[17].

Methodology

This study was a descriptive survey study. Total number of Sample size was 100 subjects. Postnatal Women from OBGY ward were taken in this study. All patients signed the written consent form prior to participation. The subjects were screened based on the inclusion and exclusion criteria. Introduction about the study was given to all the participants. The outcome selected in this study was Numerical Pain Rating Scale (NPRS) and Interrectal distance.

The inclusion criteria were; immediate postpartum women both normal vaginal as well as C- section having DRAM of 2cm or more at 2cm above umblical level. Women of age group of 20 to 45 willing to participate in the study have been included.

Exclusion criteria includes Females undergone any abdominal surgeries, any orthopaedic surgeries in past 6 months, Low back pain radiating to the lower limb, Uncooperative patient.

This study was approved by the institutional ethics committee. All subjects were questioned to ensure that they met the inclusion criteria of the study. The testing procedure was thoroughly explained to the participants. All subjects reported that they understood the test procedures and gave informed consent. Prior to DRAM measurement all subject filled a personal history questionnaire reporting any surgeries, injuries, chronic diseases, female reported a number and a type (vaginal or caesarean section) of childbirths. Each individual's height and weight were taken and BMI was calculated.

The subject was supine on examination table, both legs flexed at hips and knees, soles of both feet supported on the table, upper limbs relaxed along the body. She was then instructed to perform trunk flexion to the point when inferior angles of the scapulae were just off the table. Medial edges of the two rectus abdominis muscle were palpated. If DRAM was identified, the medial edges were marked and then in relaxed supine posture, the distance between rectus muscles was measured by transabdominal ultrasound at three levels: 5cm above umbilicus, 2cm above umbilicus and 2 cm below umblicus[18]

The ultrasound measurements were taken by a Diagnostic Ultrasound Unit Voluson E8 H48701RU US machine (GE Medical Systems) with a 2-dimensional, high-frequency (4-13 MHz) linear transducer (12.7-mm width, 47.1- mm length) was used in B-mode for all imaging. Imaging was conducted by a single investigator who is radiologist by profession and had over 200 hours of hands-on experience specific to IRD visualization and measurement using conventional USI.

Low back pain was assessed by using NPRS. The intensity of low back pain is classified into 3 groups Mild include 1 to 3 intensity, Moderate- 4 to 7 and Severe- > 8 [19]

Data Analysis and Result

The data was entered and SPSS software version 20.0 was used for statistical analysis.

A total of 100 patients fulfilling inclusion criteria were surveyed. Out of total 100 women with Diastasis Recti, 58 women have complaint of low back pain. Thus, the prevalence of Low back pain in patients with Diastasis recti is 58%. (Graph 1)

Table 1: Distribution of women according to the presence and absence of low back pain.

Low back pain	Number of women	Percentage (%)
Present	58	58
Absent	42	42

Graph 1: Prevalence of low back pain

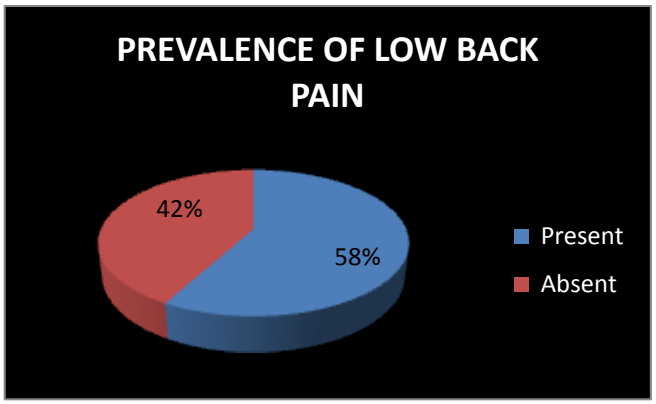
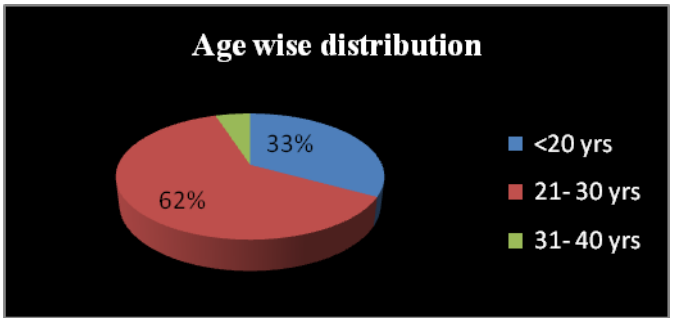


Table 2:Distribution of women according to age group.

Age	Number of women	Percentage (%)
<20 yrs.	33	33
21- 30 yrs.	62	62
31-40 yrs.	5	5

Graph 2:



Total 100 women are distributed according to age group to which they belong.

There are total 33 women below age of 20 yrs.

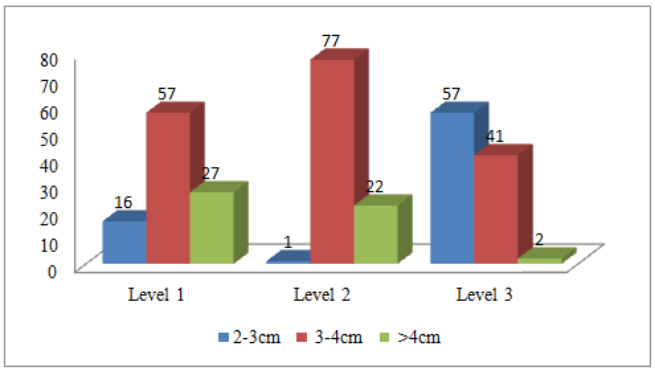
62 women are between age group of 21-30 yrs.

Only 5 women belong to age group between 31-40 yrs.

Table 3: Distribution of women according to distance of separation or diastasis.

Distance of separation	Level 1	Level 2	Level 3
2-3 cm	16	01	57
3-4 cm	57	77	41
>4 cm	27	22	02

Graph 3



The distance of separation between two bellies of rectus abdominis muscle is classified into 3 groups.

The distance of separation of 2-3 cm is maximum at the level 3 i.e. 2cm below umbilicus which is 57%.

The distance of separation between 3-4 cm is maximum at level 2 i.e. 2 cm above umbilicus and is 77%.

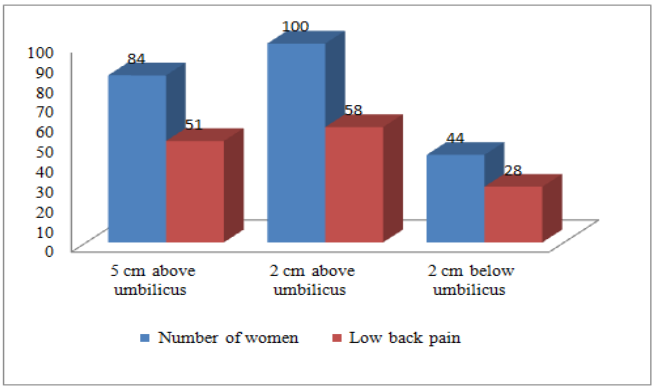
The distance of separation of >4 cm is maximum at level 1 i.e. 5cm above umbilicus 27%.

25% having distance of separation > 4cm.

Table 4: Co-relation between levels of separation and low back pain.

Level of separation	Frequency	Low back pain
5cm above umbilicus	84	51
2 cm above level of umbilicus	100	58
2 cm below umbilicus	44	28

Graph 4



The 84 out of 100 women have significant distance of separation at the level 2 cm above umbilicus and amongst them 51 women have low back pain.

At level 2, as per inclusion criteria of present DRAM,100 women have significant distance of separation and 58 women have low back pain.

At level 3 i.e. 2 cm below umbilicus 44 out of 100 have significant separation and 28 have complained of low back pain

Table 5: Distribution of women according to intensity of pain.

Intensity of pain	Number of women	Percentage (%)
Mild (1–3)	10	17
Moderate (4-7)	41	71
Severe (>8)	7	12

Graph 5

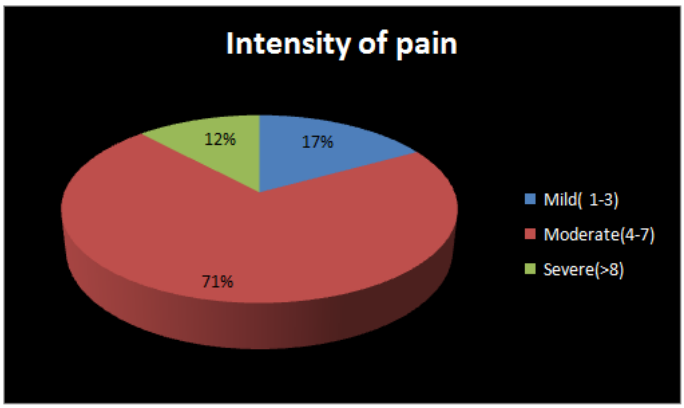
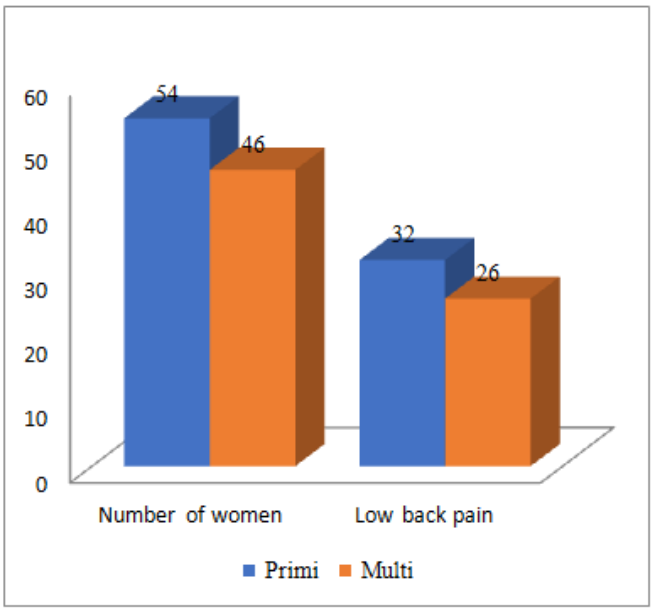


Table 6: Co-relation between parity and low back pain.

Parity	Number of women	Low back pain
Primigravida	54	32
Multigravida	46	26

Graph 6:



Out of 100 women 54 are primiparous and out of them 32 have low back pain.

Further 46 females are multiparous and 26 have low back pain.

Discussion

Abdominal wall muscle coordination and fascia play an important role in postural stabilization[6,20]. All abdominal muscles in co-operation with diaphragm and pelvic floor make up an abdominal canister which creates a hydraulic effect in abdominal cavity[21,22] regulating intra-abdominal pressure (IAP). In affect, this increase in intra-abdominal pressure stiffens the lumbar spine[22]. Rectus abdominis muscle is an important part of complex muscular system regulating IAP[23], balancing upright posture and allowing task specific trunk stabilization[24]. Therefore, it can be expected that DRA may compromise IAP regulation and spinal stabilization, making DRA a potential contributor to chronic LBP.

In simplified terms, when the inter rectal distance increases as in DRAM, it compromises the physical structure of the core and posture. This shifts chronic muscle recruitment into a compensation pattern that puts stress and strain on the back muscles, which tend to become overly tight along with the hamstrings, leading to back pain[10]. Transabdominal ultrasound has been one of the most precise method to measure inter rectal distance[16] due to its accuracy compared to intraoperative surgical compass measurement.

The results from the study suggest that there is a significant correlation between presence of diastasis recti and low back pain. According to the study results, the prevalence of Low back pain in patients with diastasis recti is 58%. Where as in the previous studies the prevalence of low back pain was 53.3%[10]. The prevalence of low back pain is more in primiparous women that is 59.52% compared to multiparous women which is 56.52%. The mechanisms behind this is unclear. It is essential for studies to be conducted independently on primiparous and multiparous women

with DRAM to find out the exact mechanisms. Studies have discussed correlation between increased intraabdominal pressure with low back pain and DRAM[25,26].

Studies have shown that substantial fluctuations in body weight can also result in DRAM[27]

Extensive research explores relationship between BMI and LBP[28, 29].

The inter rectal distance was found to be maximum i.e. 77% at 2 cm above the umbilical level. Several studies on prevalence of DRAM in postnatal women have been done, but the association and prevalence of back pain in women presenting with DRAM are understudied. The study sample were from urban – rural population. The occupation, age, BMI, and other factors may affect the results. Studies have shown higher prevalence of DRAM among urban postpartum women as compared to rural women[30]. Hence extensive studies encompassing the entire profile of the mother would be beneficial.

The findings of this study are consistent towards other studies proving the necessity of early intervention towards treatment of diastasis recti.

Conservative approach has been one of the most practiced methods for treating immediate postpartum diastasis recti[31]. It has been a topic for more extensive research. Unresolved diastasis recti have led to serious complications other than pelvic instability and lumbar back pain[32], such as urinary incontinence, fecal incontinence, and pelvic organ prolapse[33]

The ethnokinship culture followed by Indian population does not permit exercises during the peurperal period. Moreover, there has been significant casual approach towards assessment and treatment of immediate postpartum diastasis recti among obstetricians[34] as well. Ignorance among mothers for selfcare and postnatal follow up has also been seen. Prevention, early detection and early correction of DRAM is very important to avoid complications. The implementation of an individual based culturally accepted treatment protocol has become essential for the Indian scenario.

Conclusion

This study concluded that low back pain is associated with DRAM and the prevalence of low back pain was found to be 58%. The prevalence of low back pain was found to be more in primiparous women than in multiparous women.

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