

Prevalence of Diastasis of Rectus Abdominis Muscles in Young Adult with Back Pain: A Pilot Study

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DOI: <https://doi.org/10.52403/ijhsr.20230404>

ABSTRACT

Background: Diastasis recti abdominis (DRA) diagnosis via clinical examination is well defined. Abdominal muscles are important spinal stabilizers and its poor coordination, as seen in diastasis of rectus abdominis (DRA), may contribute to low back pain

Objectives: This pilot study to find out the prevalence of DRA in young adults with Back pain.

Methods: Using a finger width palpation method. Standard clinical DRA measurement was performed in 213 participants with or without low back pain in both genders.

Results: Out of 268 subjects (219 female, 49 male) only 2.98 % had complain of back pain. So back pain is not correlate with DRA and BMI significantly. Only 17.74 % adults had 1 cm inter-rectus distance which is normal at umbilical level.

Conclusion: The result of this study shows that young adult gets affected by back pain but not significantly.

This study concludes that there is equal IRD measurement in both genders irrespective of age sex and BMI and no significant prevalence of DRA in young adults.

Key words: Diastasis Rectus Abdominis, Inter-rectus distance, body mass index, low back pain

INTRODUCTION

Diastasis rectus abdominis (DRA) is a separation of the abdominal muscles in the midline and seen in 33% to 74% of women in the post partum period.^{1,2}

According to Rath³ et al, only separation exceeding 10 mm above the umbilicus, 27 mm at the umbilical ring and 9 mm below umbilicus should be considered abnormal in subjects younger than 45 years, the corresponding values for an older population to be 15mm,27mm and 14 mm respectively. However, clear consensus does not exist and different authors suggest different opinions to define DRA.⁴ DRA are very common in pregnancy and post

partum women^{5, 6}. However, it is also known to occur in men.⁷

Research on DRA mostly targets pregnant and post partum women and is uncertain on its relation to LBP or its occurrence in men. For example, Mota⁸ et al found that women with remaining DRA post –partum were not more likely to suffer from low back pain while Parker⁹ et al, reported that women with DRA conclude that a higher degree of abdominal or pelvic region pain, which may also signal LBP. Coordination of lumbopelvic, abdominal muscles and fascia play a significant role in respiration and musculoskeletal function including postural stabilization⁶ back pain, pain from abdomen and impairment of physical exercise have

previously been identified as DRA related symptoms.¹²

Abdominal muscle weakness has been shown to cause back strain and pain.¹¹ According to Gitta¹² et al. not just low back pain but also decreased quality of life may occur in patients with DRA.

This given research indicating that DRA may compromise postural stabilization strategies, it is also possible that DRA is related to LBP

No study has been done yet to find out the association between DRA and LBP in young adult population, apart from pregnancy and post partum women.

This study is to investigate whether LBP may associated with DRA in a pilot study measuring DRA in 173 women and 41 men with and without LBP by using finger palpation method.

INCLUSION CRITERIA:

- 18 to 25 years
- Both gender
- young adults
- Complain with back pain

EXCLUSION CRITERIA:

- Pregnancy
- Major abdominal surgery
- Neurological abnormality
- Musculoskeletal conditions
- Malignancy
- Cardiopulmonary conditions
- Pathological back pain

METHODS AND MATERIALS

PARTICIPANTS

Total 268 subjects, aged 18 to 25 years, 219 females and 49 males with and without low back pain .out of 219 females only 3 female had history of low back pain and out of 49 men only 5 male had h/o low back pain. All had under gone IRD measurement by using finger palpation method.

METHODS

This study was approved by the institutional ethics committee. All participants were selected according to inclusion criteria of

this study. The procedure of testing was thoroughly explained to the participants. All participants reported about oral and written consent.

Before testing all participants filled a personal history form reporting any major surgeries, chronic diseases and medical conditions. Each subject's height and weight was taken and BMI was calculated. Slanderred clinical method to measure DRA using a finger palpation method¹³ has been used.

The subject was supine on plinth, both legs fixed at hips and knees, soles of both feet supported on the table, upper limb relaxed along the body.

Then each subject was instructed to perform trunk flexion to the point when scapulae were clear the table. Rectus abdominis muscle were palpated and identified DRA then relaxed supine position. By using finger palpation method.

We measured above umbilical level (4.5 c. m), at umbilical level. And below an umbilical level (4.5 c. m) as suggested by Rath¹⁴ et al. This classification was applied for statistical analysis.

STATISTICAL ANALYSIS

All variables were individually presented for those with vs. without LBP, who were selected with same age and sex, and for those with vs. without DRA. Mean difference for Age, height, weight, and BMI were compared to LBP and to DRA by using percentage method.

RESULTS

The mean IRD for all subjects as measured by finger palpation method for each measurement condition and location, are mentioned in Table 1. By finger palpation method this IRD was taken at three different locations that is 4.5 c.m above umbilicus, at umbilicus and 4.5 c.m below the umbilicus in each subjects values given in Table 2. Out of 268 subjects only 2.98% subjects had complain of back pain and increased BMI compared to subjects with no complain of back pain. Table 3 and Table 4.

Only 17.74 % adults had 1 cm inter-rectus distance which was normal at umbilical level. This indicates male female both equally affected by low back pain

TABLE 1 General information of the adult population (n=213)

N=268	MALE (n=49) Mean	FEMALE (n=219) Mean	P – value
AGE	21.67	19.96	0.077
HEIGHT (cm)	169.90	157.49	0.610
WEIGHT (kg)	60.34	50.04	0.205
BMI (kg/m ²)	20.67	20.18	0.114

BMI- body mass index

TABLE 2 IRD measurement at three different levels in both genders

N=268	MALE (n=49) Mean	FEMALE (n=219) Mean	p- values
ABOVE UMBILICUS (4.5 cm)	0.46	0.262	0.002
AT UMBILICUS	0.92	0.856	0.005
BELOW UMBILICUS (4.5cm)	0.39	0.158	0.002

Interectus distance (IRD)

TABLE 3 The distribution of all subjects according to c/o back pain

N=213	BACK PAIN present	BACK PAIN Absent
Male (N=41)	05	44
Female (172)	03	216

TABLE 4 The distribution of back pain subjects according to their BMI and IRD (1.5 cm per fingerbreadth)

N=8	BMI (kg/height)	IRD (cm) at three levels		
Male (5)	23.47	1.6	1.04	0.40
Female (3)	20.25	0.46	1.23	0.00

DISCUSSION

We examine the association between DRA and back pain overall, in men and women especially in young population separately. It concludes that DRA was not found in this age group, but LBP was significantly correlate to BMI in men compared to female.

We observed that BMI is strongly associated with LBP, that suggesting that increased weight may leads to one mechanism through which LBP relates to BMI, the importance of clinical implications that should be tested further especially for this young population.

It is observed that low back pain occurs more frequently with DRA because of overuse of back muscles resulting from

efforts to compensate for lost abdominal wall stability.¹⁵

In this study the association between LBP and BMI was observed mainly in men provides some support for this possibility as men tends to engage in more strenuous activities , increasing the change of back muscles overload. Doubkova et al concluded that the DRA was about 2.5 times more common in patients with LBP compared to without LBP and the increased odds of chronic LBP with the occurrence of LBP was mostly attributable to the association between DRA and LBP in men, not in women.¹⁶

Further research should test DRA that increases significantly during postural activities truly affects the low back stability and results in LBP. Bitnar p et al, stated that abdominal muscles function play an important role in postural stabilization.¹⁷

LIMITATION

In this study the finger palpation method was used which has high validity but still there are other more valid and precise method to measure ird such as ultra sonography and vernier caliper method. This test is totally subjective so result may vary and also a sample size is also too small. That is why we cannot generalize these values for whole young population.

CONCLUSION

The result of this study shows that young adult gets affected by back pain but not significantly.

This study concludes that there is equal IRD measurement in both genders irrespective of age sex and BMI and no significant prevalence of DRA in young adults.

For further studies on DRA in patient of back pain with larger sample size can be investigated for generalization.

Declaration by Authors

Ethical Approval: All procedures done in this study involving human participants were in accordance with the ethical standards of the institutional research

committee of B.J Medical College, Civil Hospital, Ahmadabad, Gujarat.

Acknowledgement: To Dr Sunil Charpot who is M.D radiologist had great contribution to this study by continuously sending patients who were fit for this study according to inclusion criteria.

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

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How to cite this article: Vinal Damor, Sunil Charpot. Prevalence of diastasis of rectus abdominis muscles in young adult with back pain: a pilot study. *Int J Health Sci Res*. 2023; 13(4):35-38.
DOI: <https://doi.org/10.52403/ijhsr.20230404>
