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PREVALENCE OF DIASTASIS RECTI ABDOMINIS USING DIAL VERNIER CALLIPER AMONG OVERWEIGHT MALES: AN OBSEVATIONAL STUDY

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KEYWORDS :

INTRODUCTION

The separation of two rectus abdominis muscles at Linea alba, which covers the front surface of the abdomen is known as Diastasis recti abdominis (DRA)[1]. In the Linea alba, collagen fibers from both sides of the abdominal wall muscle sheets cross in an interwoven pattern, this structural characteristic ensures core stability under abdominal muscle tension which allows the accommodation of intra-abdominal volume by chronic separation of the medial borders of the rectus muscles[2]. In DRA it involves gradual thinning and widening of Linea alba with general laxity of ventral abdominal wall[3]. The space formed by separation of the Linea alba in DRA called as an inter-recti distance (IRD)[4]. DRA can develop at three levels with respect to umbilicus - above, below or at the umbilicus and distance of 2 cm is considered normal and larger than it called as rectus diastasis [1,5]

This condition is commonly seen in the childbearing woman, although it is not exclusive to this population and can also be found in men[6]. Current concepts about rectus diastasis are based on the development and treatment of RD in females but in male's hormones and intra-abdominal pressure play a role in the development of rectus diastasis[4].

Diastasis recti abdominis (DRA) is a separation of two rectus abdominis muscles at Linea alba, which covers the front surface of the abdomen. In Males, diastasis recti is a rare and different concept. As compare to male population large scale studies are carried out in female population and rehabilitation programme is also research to overcorrect it but very few studies are conducted in male population and is under negligence. Also, there is lack of data among overweight males as comparative to obese male and thus it becomes crucial to gather more evidences and to carry out research in this specific population. Also, now a days one third of world's population is overweight and obese which leads to its morbid effect.

Objectives

Objectives of the Study Were-

- To asses diastasis recti abdominis using dial vernier calliper among overweight males
- To assess the categorial severity of diastasis recti abdominis

METHODOLOGY

This crosssectional study was conducted in overweight males fulfilling the criteria, from residential area of Bangalore.

Study protocol was approved by Institutional Ethics Committee. The study population was selected by Convenient sampling method. The study was conducted over a period of six months.

Inclusion Criteria for the Study Were:

- Subjects were age group of 35 years and above.
- Genders: Males
- Subjects: with BMI:- 25-29.9kg/m^2

Subjects Were Excluded if:

- Subjects undergone abdominal and spinal surgery.
- Subjects having pathological back conditions (PIVD, lumbar spondylolisthesis, lumbar canal stenosis, severe low back pain, etc.)
- Subjects suffering from hernia.
- Those who failed to sign the informed consent document.

Procedure

Ethical approval was taken from college sub-ethical committee and consent forms were filled. The subject will be permitted to rest any time between the measurements. On the Cut-off value of diastasis recti abdominis measurement: The subjects will be classified into three categories depending on the largest measured inter-recti distance as,

(1) Mild diastasis - 2–3 cm,
(2) Moderate diastasis -3–4 cm
(3) Severe diastasis-4cm or more

Data Analysis

Statistical analysis was performed by using SPSS software for windoe and p-value were set as 0.05. Descriptive statistics was used to analyse the base line demographic data. Towards estimation of sample size for this cross sectional study, the following guidelines were used: n = 96

RESULTS

Table 6.1. The Age Wise Distribution of Subject

Age in Numbers	No of participants
35-39 years	16
40-44 years	22
45-49 years	32
50-55 years	26

- Out of total 96 participants, 32 were in 45-49 years group, 26 in 50-55 years of group, 22 were in 40-44 years of group, 16 were in 35-39 years of group

Table 6.3. The Level of Severity of DRA in Subjects

Level of Severity	No of Participants
Mild DRA 2-3 cm	22
Moderate DRA 3-4 cm	28
Severe DRA >4cm	2

- Out of total 52 participants with DRA 28 Participants are with moderate DRA, 22Participants with mild DRA and only 2 with Severe DRA

RESULTS

- In the following study, we found that out of 96 overweight male subject's Diastasis Recti Abdominis is present in 52 subjects (54.16%) which was calculated by using the dial vernier caliper.

- The categorial severity found was moderate diastasis recti abdominis in total 28 subjects, mild DRA in 22 subjects and severe DRA in 2 subjects.

DISCUSSION

Male diastasis is a rare and different concept. Till now research on Diastasis Recti was carried only in postpartum women and other conditions in female population. This research is done in very less number in male population. Also, In recent days due to increase in the sedentary lifestyle and excessive changes in the food habits along with less physical activities of the body, the one third of world's population is overweight and obese, Thus it becomes crucial to do more research in male and overweight population to prevent them from risk factors(like low back pain, urogenital dysfunction and hernia etc.). The present study demands with the chief objective to see the presence of diastasis recti abdominis in overweight male population , which shows the result - presence of 54% of DRA among overweight male of the age (35-55 years).

This may be due to following reasons:-

- As the age progresses muscle mass along with the muscular infiltration of noncontractile elements may influence muscular performance such as strength and rapid force production.
- Skeletal muscle mass decreases with aging, by 30%-50% between the age of 40 and 80 years. It is well established that loss of muscle mass contributes to muscle weakness.
- Several studies also demonstrated that the amount of intramuscular fibrous and adipose tissue in the muscle increases with aging in 38-40 years. In some reports, it was revealed that muscle mass along with muscle quality influences muscle strength.
- Ota et al. demonstrated that age-related decreases in muscle thickness of the rectus abdominis and external oblique muscles occur after 50 years of age; on the other hand, age-related changes in muscle quality, which were measured by muscle echo intensity occur after 30 years of age.
- Due to the physiological changes in the muscle, factors (like heavy weightlifting, full sit ups, familial weakness of the abdominal muscles) increases the intra- abdominal pressure which further leads to presence of Diastasis Recti Abdominis. Android obesity causes stretching and widening of the Linea alba. The Linea alba is the insertion point for the central seam of connective tissue fascia of the rectus abdominis, transversus abdominis and the oblique muscles. This lattice of collagen fibers spans the length from the xiphoid to the pubic symphysis and a thus our study demonstrated that the greatest widening occurs at the level of the umbilicus. In obesity, stretching of the Linea alba occurs as a consequence of hormonal elastic connective tissue changes and the mechanical strain put on the abdominal wall by 22 increasing circumstance of abdomen and displacement of abdominal organs. These stresses alter the spatial arrangement of the abdominal muscles and fascia, and modify their optimal line of action reducing their ability to generate force which may leads to develop diastasis recti in overweight male.
- Another study conducted by Qu E and Zhang X who measured IRD at 4 locations (at the umbilical level, 3 cm above the umbilicus, 6 cm above the umbilicus, and 3 cm below the umbilicus) in 100 healthy nulliparous females and 99 postpartum females. They found positive correlation of BMI with IRD in 100 healthy nulliparous females ($r = 0.286$).
- Kaufmann, Reiner C, Dietz U , Clavien P, Vonlanthen R, Käser A conducted study on Normal width of the Linea alba, prevalence, and risk factors for diastasis recti abdominis in adults, a cross-sectional study concluded that in general population, the prevalence of DRA is as high as 57% and age, parity, BMI are independent risk factors of DRA and the mean Linea alba was 22mm(±SD 12.88) in an adult population of all age groups.
- The study concluded that diastasis recti abdominis is present among overweight males. This cross-sectional observational study was conducted among 96 overweight males aged 35–55 years in Jalgaon using convenient sampling. Participants with BMI between 25–29.9 kg/m^2 were assessed for DRA using a dial vernier calliper at points above and below the umbilicus in hook-lying position. Two readings were recorded and averaged. DRA severity was categorized as mild (2–3 cm), moderate (3–4 cm), and severe (>4 cm).
- The study found that 52 out of 96 participants (54.16%) had DRA, while 44 participants did not show DRA. Among affected participants, 22 had mild DRA, 28 had moderate DRA, and 2 had severe DRA, with moderate DRA being the most common category. The study concluded that DRA is prevalent among overweight males and highlights the need for early assessment and preventive intervention in this population.

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