"STUDY OF LOW BACK PAIN IN OBESE PATIENTS"

Abstract

Low back pain, a very common presenting complaint in orthopaedic Outpatient department is caused by various factors such as strenuous physical work, Poor Posture, Trauma, Age related degeneration of vertebral joints and various diseases of ligaments and bones. Overweight and Obesity cause changes in Posture and biomechanics of lumbar spine function and weight transmission. Relationship between low back pain and Obesity requires study to learn about its causation and its effect. This study is an attempt in this direction by measuring the parameters of Body mass Index and its effects on Lumbosacral angles.

Keywords: Low back pain, Overweight, Obesity, Lumbosacral angles

Introduction

Overweight and obesity is a serious community health problem that contributes to the global trouble of chronic disease as a pandemic condition[1]. Hypertension, Diabetes and Obesity have been considered as predisposing factors to diseases like Gastro-oesophageal reflux, Obstructive sleep apnoea (OSA), certain types of cancers like breast cancer(post-menopausal), endometrial cancer, Gastro intestinal track related cancer etc.[2]

Obesity causes changes in normal function and biomechanics of vertebral column and big joints of limbs[3,4]. Study of curvature and angles of Lumbar and sacral spine helps to understand transmission of upper body weight to the trunk and lower limbs. Lumbosacral angles could be affected by various factors such as race, age, posture, diseases of spine and surgery on the spine[5,6]. Due to Obesity the lumbosacral spine undergoes changes in its alignment causing chronic back pain[7,8]. Complaint of low back pain is one of the most common complaints in Outpatient department in Orthopaedics.

Various studies have been done to corelate obesity to chronic nonspecific back pain in adult population[7]. The objectives of the present study,

titled “Study of Low back pain in Obese patients”, being done in tertiary care rural hospital, are to compare the lumbosacral angles in overweight and obese people with non-obese persons and to analyse the relation of Body Mass Index on Lumbosacral angles

MATERIALS AND METHODS

The present Study type is Prospective Cross-sectional study. The Study period is from November 2020 to October 2022. Study sample size is 100 each for case and control, as calculated by **Sample Size formula with desired error of margin:**

$$n = \frac{2x^2/2 \cdot P \cdot (1 - P)}{d^2}$$

where ,

$2x^2$ is the level of significance at 5% level of significance i.e. 95% confidence interval = 1.96

P = Prevalence of low back pain

D = Desired error of margin

The inclusion criteria are patients between 20 to 60 years of age who complain of nonspecific chronic low back pain (LBP) without any radiation to lower limbs and without any history of neurologic, respiratory, musculoskeletal or lower limb pathology.

Patient having spinal deformity such as scoliosis or kyphosis and or suffering from Ankylosing spondylitis, severe Osteoporosis, Progressive

Neurologic disease or Vertebral infection are the exclusion criteria for this study.

Methods:

Adult patients of non-specific chronic LBP (case group) consenting to participate in the study will be enrolled. The demographic details of the patients and the details of complaints will be noted. Physical examination including a detailed examination of spine in terms of inspection, palpation, movement and alignment will be done. X ray lumbosacral spine AP and Lateral view will be taken.

Body mass index (BMI) will be measured from weight and height of the patient. The various angle in lumbosacral spine will be measured as shown below. Corelation between BMI and lumbosacral angles will be found out.

Similar study on normal adults (control group) without any complaints of LBP will be carried out simultaneously. Medical students, Post-graduate residents and staff of the hospital will be encouraged to participate as control subjects.

Comparison between patients of LBP and control group will be done and suitable conclusions drawn.

BMI is measured by weight of person in Kg divided by height of patient in meter square[10]. A person is labelled underweight if BMI is below 18.5. BMI of 18.5 to 24.9 is said to be the normal range. Person is called Overweight if BMI between 25.0 to 29.9. Obesity is divided in three class with Class I (BMI – 30.0 to 34.9), Class II (BMI – 35.0 to 39.9) and Class III (If BMI is more than 40).

The following angles will be measured to asses relation between obesity and lumbosacral angles:

1. lumbosacral angle (LSA): A
2. sacral inclination angle (SIA): B
3. lumbosacral disc angle (LSDA): C
4. lumbar lordosis angle (LLA): D

Age, posture, race, disease, and surgery can affect these angles between the lumbar spine and sacrum

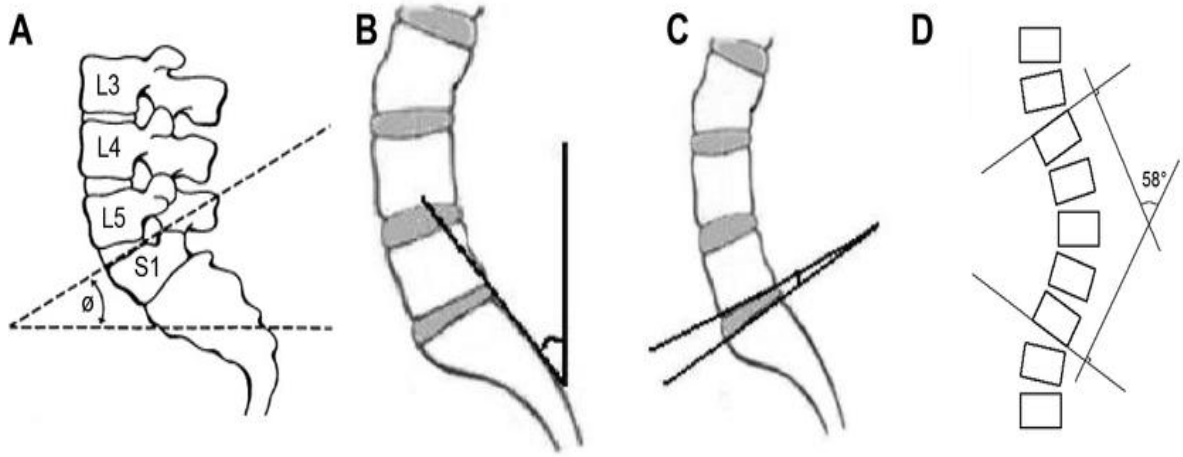

Figure 1 A, B, C and D are showing lumbosacral spine's geometric angles and how to measure it.

Lumbosacral angle (LSA) is the angle measured between upper border of 1st sacral vertebra and the horizontal plane. Sacral inclination angle (SIA) is measured between Vertical line and a line along the posterior border of S1 vertebra. Lumbosacral disc angle (LSDA) is the angle measured between superior end plate of S1 and the inferior end plat of L5 intervertebral disc.

Lumbar lordosis angle (LLA) is angle formed by intersection of two perpendicular on the lines drawn through superior end plate of L1 and inferior end plat of L5.

Conclusion:

The study will compare the above angles in relation to BMI in case and control subjects and suitable conclusion will be drawn. The Statistical analysis will be done using SPSS version 17.0.

Disclaimer regarding Consent and Ethical Approval:

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors

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