

Brief Research Report

To Investigate How Core Stability Exercises Affect Patients with Mechanical Low Back Pain Who Work Desk Jobs

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ABSTRACT

Background

Mechanical low back pain (MLBP) is a mechanically-derived, musculoskeletal back pain not involving nerve root compression or serious spinal diseases. Prevalence is higher in young and active adults with nearly 60% people. These people have suffered from low back pain at some time during their lifespan. Low back pain also restricts mobility, interferes with normal functioning and results in lifelong pain and permanent disability. Lack of spinal core stability is supposed to be one of the important predisposing causes of recurrent low back pain.

Objective of the Study

To investigate the effect of core stability exercise on pain intensity in patients with mechanical low backache.

Methods and Materials

All 10 eligible young patients both male and female were included in the study. They were suffering from no radiating non-specific low backache after sitting at desks for an extended period of time from last six weeks. They were informed about the study. Informed consent was taken from the willingly participating patients after explaining the procedure from subjects, by experiencing non-specific low back pain since six weeks. Measures of pain intensity on visual analogue scale (VAS) was recorded. The study was conducted in a busy physiotherapy centre in Ludhiana, Punjab, India. Data was collected on day 0 and day 21. It was statistically analyzed by student's unpaired *t*-test and results were obtained. Comparisons were made between day 0 and day 21 on included subjects. Exercise like abdominal curl ups, progressive exercises in hook lying with cycling, quadruped positioning, prone lying with progression to contralateral upper and lower extremity lifting and then head, trunk, arm and leg lifts for 30 second hold 5 repetitions at day 0 progressing to 10 and then 15 repetitions at day 21.

Results

The study showed that the values on unpaired *t*-test were significant and relevant in statistical and data analysis on 5% level of significance.

Conclusion

Core stabilization helps to decrease pain intensity in mechanical non-specific low back pain. Core stabilization exercises should be an integral component of treatment protocol for patients with low back pain.

Keywords

Mechanical low back pain; Core stabilization exercises; Pain.

INTRODUCTION

Mechanical low back pain (MLBP) is a mechanically-derived, musculoskeletal back pain not involving nerve root compression or serious spinal diseases. Prevalence is higher in young and active adults. Causes of MLBP typically are attributed to an acute traumatic event, but they may also include cumulative trauma as an etiology. The weakness of the superficial trunk and abdominal muscles is an important risk factor for low back pain. Strengthening these muscles markedly improves chronic low back pain and decreases functional disability. Another independent risk factor for chronic low back pain is weakness and lack of motor control of deep trunk muscles, such as the lumbar multifidus (LM) and transversus abdominis (TrA) muscles.¹

Mechanical spinal pain due to mechanical deformation of soft tissues is classified into postural, dysfunctional and derangement syndromes. Excess flexion causes deformation in lumbar spines and progress with time irrespective of age.²

Mostly low-income group people are engaged in physically demanding jobs which increases the risk of low back pain and disability. In India, nearly 60% of the people suffered from low back pain at any point of time during their lifespan. Low back pain also restricts mobility, interferes with normal functioning and results in lifelong pain and permanent disability.³

Lack of spinal core stability is supposed to be one of the important predisposing causes of recurrent low back pain. As a result, more attention has been paid to the training of localized spinal stabilizer muscles in subjects with LBP specific stabilization exercises lead to changes in motor programming of the automatic feed-forward recruitment of deep core muscles. Therefore, stabilization exercises are suggested for chronic low back pain patients.⁴

Exercises for low back pain have evolved over the period of time with a specific emphasis on maintaining the spinal stability. Core stabilization exercises are aimed at improving the neuromuscular control, endurance, strength of muscles central to maintaining dynamic spinal stability. Transversus abdominis (TrA), lumbar multifidus, and other paraspinal, abdominal, diaphragmatic, and pelvic musculature are targeted in core stabilization exercises.⁵

RESEARCH DESIGN AND METHODOLOGY

All 10 eligible young patients both male and female were included in the study. They complained of a low backache in the last six weeks with non-specific cause. Informed consent was taken from subjects after explaining the protocol. Measures of pain intensity on visual analogue scale (VAS) were recorded. The study was conducted in a busy physiotherapy center in Ludhiana, Punjab, India. Data were collected on day 0 and day 21 and statistically analyzed by students unpaired *t*-test and results were obtained and comparisons were made between day 0 and day 21 on included subjects.

Treatment starting with activation of the core muscle

like learning motor control for multifidus and transversus abdominis muscle like abdominal drawing maneuvers were taught to all patients and after that beginners/basic exercises for core muscles taken from Kisner 6 like abdominal curl-ups, hook-lying with straight leg lift to 45°, hook lying lower extremity alternating bicycle, quadruped position progressed to flexing upper extremity and extending contralateral lower extremity, prone position progressed to lifting legs, arms, trunk and head. Initially beginning as per patient convenience 30 seconds hold for 5 repetitions progressed to 10 at 14 days and 15 repetitions at 21 days on which follow-up was taken for PRE and POST exercise intervention.

Data analysis using the unpaired *t*-test

By conventional criteria, this difference is considered to be statistically significant.

Confidence interval:

The mean of VAS Day 0 minus VAS Day 21 equals 1.70

95% confidence interval of this difference: From 0.45 to 2.95

RESULTS

The study was completed with a total 10 subjects (Table 1) both male and female were included. There is no significant difference in the mean ages between the subjects. The comparison of pre and post scores of VAS within two groups (Figure 1 and Table 1). It shows, in both the groups there was significant improvement between pre and post mean scores.

Figure 1. Measures of Pain Intensity from Day 0 till Day 21

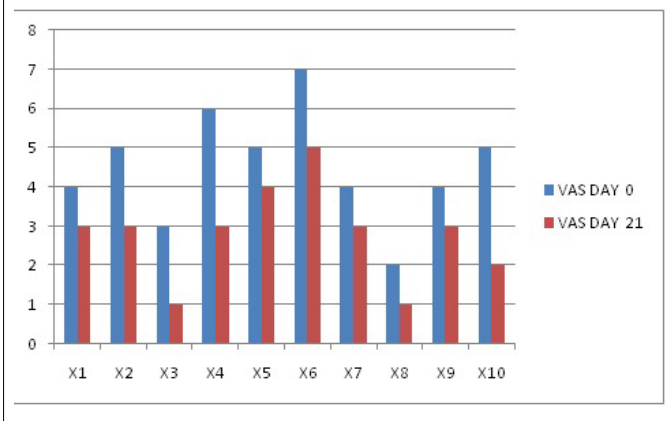


Table 1. Measures from Pain Intensity Measured Using VAS Scale

Group	VAS Day 0 (PRE)	VAS Day 21 (POST)
Mean	4.50	2.80
SD	1.43	1.23
SEM	0.45	0.39
N	10	10

DISCUSSION

Mechanical low back pain is described as a musculoskeletal pain which varies with physical activities and not involving root compression or serious spinal diseases.⁷

The primary aim of this study was to determine performing exercises for the core stabilization resulted in reducing back pain more effectively. Exercise programs that aim to improve the stability of the lumbar spine are widely utilized in the management of patients with chronic low back pain. These programs target a variety of trunk muscles and aim to optimize the control of segmental motion, spinal stability, spinal stiffness, spinal orientation, or a combination of these characteristics.⁸

Franca et al compared the efficacy of two exercises programs-segmental stabilization and superficial strengthening of abdominal and trunk muscles-on pain, functional disability, and activation of the TrA muscle in individuals with chronic low back pain. Both techniques resulted in pain amelioration and reduced disability.⁹

Similar studies by Koumantakis and O'Sullivan of chronic low back pain, spondylolysis or spondylolisthesis demonstrated a decrease in pain in subjects allocated to the core stabilization group. Core stabilization exercise enhances the ability of the segmental muscles that result in improved function and decreased pain in the subject with chronic nonspecific low back pain.¹⁰

CONCLUSION

Core stabilization exercises lowered pain intensity in mechanical non-specific low back pain hence Core stabilization exercises should be an integral component of the treatment protocol for patients with low back pain.

CLINICAL IMPORTANCE

In a short period of time, there was a reduction in intensity of back pain. It is easy to learn and an inexpensive method of treatment.

LIMITATIONS

The sample size was small, limited outcome measures for investigation were used.

FUTURE DIRECTIONS

Usage of sophisticated instruments for investigating the muscle function and fitness level can be used.

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CONFLICTS OF INTEREST

None of the authors have any conflicts of interest.

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