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Effectiveness of myofascial release technique on pain and anterior pelvic tilt among subjects with mechanical low back pain

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Abstract

Background of the study: Mechanical low back pain (MLBP) is a prevalent and disabling condition that can severely affect a person's quality of life. MLBP patients primarily complaints pain in the lower back, stiffness, movement restriction and abnormal anterior pelvic tilt. The impact of MLBP extends beyond physical discomfort, often leading to emotional distress, decreased productivity, and increased healthcare expenses. Addressing mechanical low back pain is essential to improve quality of life, restore functionality, and prevent potential complications also promptly ensures you stay active, functional, and pain-free in the long run. Various physiotherapy approaches are available to treat the patients with MLBP. This study was an attempt to find the effects myofascial release technique on the variables of mechanical low back pain.

Objective of the study: The objective of the study was to find the effects of four weeks of myofascial release technique on mechanical low back pain and anterior pelvic tilt among subjects with mechanical low back pain.

Methodology: 40 patients with mechanical low back pain were selected based on the inclusion and exclusion criteria and underwent myofascial release technique for a period of four weeks. Mechanical low back pain and anterior pelvic tilt was measured before and after 4 weeks of intervention by numerical pain rating scale and kinovea software respectively.

Results: The obtained data's were statistically analysed by paired 't' test at 0.005 level of significance and found that there is significant difference between the pre and post test scores of mechanical low back pain and anterior pelvic tilt.

Conclusion: Four weeks of myofascial release technique significantly reduced mechanical low back pain and anterior pelvic tilt among mechanical low back pain patients.

Keywords: Mechanical low back pain, anterior pelvic tilt, myofascial release technique

Introduction

Mechanical low back pain (MLBP) is a prevalent and disabling condition that can severely affect a person's quality of life. It refers to pain originating from the spine, intervertebral discs, ligaments, muscles, or facet joints, typically due to abnormal stress or strain on these structures. It is the most common type of low back pain, abnormal pelvic tilt and usually does not involve nerve root compression persistent or recurring pain in the lower back, lasting for at least one year. The impact of MLBP extends beyond physical discomfort, often leading to emotional distress, decreased productivity, and increased healthcare expenses ^[1].

This condition varies from person to person, typically resulting in reduced functional abilities and overall health, limiting everyday activities and diminishing quality of life. Studies indicate that individuals with MLBP tend to experience pain and disability for longer periods compared to other types of pain. Additionally, non-specific back pain, which lacks a specific cause, is increasingly common among younger people and may predispose them to MLBP in adulthood ^[2].

MLBP is also associated with various physical, psychological and social factors. Physical Factors like degenerative disc disease, facet joint arthritis, muscle strain or spasm, spinal stenosis or spondylolisthesis, sacroiliac joint dysfunction, herniated or bulging discs, vertebral fractures, fibromyalgia and ankylosing spondylitis. Psychological Factors emotional Stress, catastrophizing and fear-avoidance behaviour.

Finally the social and lifestyle factors sedentary lifestyle, occupational factors, sleep disturbances, obesity and smoking [3].

Current treatment approaches for MLBP focus on improving functionality and helping patients resume their usual activities. There are many treatment options like exercise therapy, neuromuscular re-education, education and self-management, modalities, graded activities, medication, surgical interventions, and manual therapy [4].

Myofascial release (MFR) is a manual therapy technique, it involves applying gentle, sustained pressure to the myofascial connective tissues to alleviate pain, improve mobility, and restore functional movement. While MFR is widely used in manual therapy, scientific evidence supporting its efficacy is mixed. Hence this study aims to find the effect of myofascial release technique on pain and pelvic tilt among mechanical low back pain subjects [5].

Materials and Methods

This single-group experimental study was approved by the Review Board of Sudha Hospital, Vadalur, Tamil Nadu. Written informed consent was obtained from all participants after providing clear instructions about the treatment procedure and its implications. The study was conducted in the outpatient department of physiotherapy at Sudha hospital, Vadalur, Tamil Nadu, India.

Forty patients, aged 20 to 30 years, clinically diagnosed with mechanical low back pain were selected for the study, including both males and females. Individuals with other types of low back pain, inflammatory arthritis, spinal pathologies, pregnancy, nerve root disorders, or any other confounding factors were carefully identified and excluded.

All participants underwent the myofascial release (MFR) technique. During the procedure, patients were seated in a chair and instructed to lean forward while the therapist applied the MFR. The therapist performed the MFR from the mid-thoracic to the pelvis area using the metacarpophalangeal joints of the index, middle, and ring fingers. This movement was repeated five times. The patients sat in a chair, bent forward, and placed elbows on knees in the following three positions. With fingertips of both hands, the therapist applied the MFR of the erector spine muscles on both sides of the lumbar spine [6]. This technique was done in three positions: bending forward, bending forward by turning to the right, and bending forward by turning to the left, and for each part with five repetitions. The intervention involved repeating the exercises 5 times per session, with 2 sessions held each week, over a total duration of 4 weeks.



Fig 1: MFR Erector Spinae



Fig 2: MFR Flexion



Fig 3: MFR Flexion & Side Bend

Mechanical low back pain and anterior pelvic tilt was measured before and after 4 weeks of intervention by numerical pain rating scale and kinovea software respectively. To measure the anterior pelvic tilt by Kinovea software, the subjects were made to stand in a normal, relaxed position without shoes or footwear on a level floor, and both hands were placed on the opposite shoulder. The participants' photos were taken on a sagittal plane where markers are clearly visible. Both the right and left sides of the pelvis were photographed. The photos were then uploaded to the laptop with Kinovea software installed. The images were then processed by Kinovea software, where the anterior pelvic tilt angle was measured in the sagittal plane [7].



Fig 4: Anterior Pelvic Tilt Measurement by Kinovea software

Data Analysis and Results: The study aims to find the effects of myofascial release technique on mechanical low

back pain and anterior pelvic tilt in the selected subjects.

Table 1: Mean value, mean difference and paired 't' value of mechanical low back pain and anterior pelvic tilt

Variable	Pre Test Mean	Mean Difference	Standard Deviation	Paired 't' Value
	Post Test Mean			
Mechanical Low Back Pain	7.0000	8.20	2.48087	14.782*
	3.0500			
Anterior Pelvic Tilt	18.5800	3.95	1.09904	16.073*
	10.3800			

*0.005 level of significance

The calculated paired 't' values for mechanical low back pain and anterior pelvic tilt were 14.782 and 16.073 respectively and the 't' table value is 2.977 at 0.005 level. Since all the calculated 't' values are more than the 't' table value, there is significant difference between pre and post test scores of mechanical low back pain and anterior pelvic tilt following myofascial release technique among patients with mechanical low back pain.

Discussion

The results of the present study shows that myofascial release technique is effective in reducing mechanical low back pain and anterior pelvic tilt among patients with mechanical low back pain. The same was supported by many researchers.

Fascia tends to shorten, thicken, and become stiffer following trauma or skeletal injuries. Because of its close connection with the underlying muscles, fascia can transmit these issues and lead to dysfunctions in the musculoskeletal system [8]. On the other hand, MFR directly affects the fascia layers and improves the damaged condition of the fascia tissue. This treatment can affect the underlying muscular structures and relieve the pain [9].

Conclusion

Four weeks of myofascial release technique significantly reduced mechanical low back pain and anterior pelvic tilt among mechanical low back pain patients.

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