

Effect of Latissimus Dorsi Muscle Strengthening in Mechanical Low Back Pain

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Abstract: Mechanical low back pain (MLBP) is one of the most common musculoskeletal pain syndromes, affecting up to 80% of people at some point during their lifetime. Sources of back pain are numerous, usually sought in as lesion of disc or facet joints at L4-L5 and L5-S1 levels. Studies have shown that 40% of all back pain is of thoracolumbar origin. The term mechanical low back pain also gives reassurance that there is no damage to the nerves or spinal pathology. The clinical presentation of mechanical low back pain usually the ages 18-55 years is in the lumbo sacral region. A study was conducted to evaluate the designed to check the effectiveness of Conventional Exercises alone in Mechanical low back pain and along with the latissimus dorsi muscle strengthening, data was collected from People's hospital, Bhopal (age group-30-45 yr both male and female randomly)

Keywords: Visual analog scale, Assessment chart, Treatment table, Data collection sheets, Essential stationery materials, Computer, SPSS Software etc.

1. Introduction

Mechanical low back pain is defined as a result of minor intervertebral dysfunction and referred pain in the low back and hip region, and can often be confused with the other pathologies that may cause these symptoms.¹⁸

Back pain is a primary to seek medical advice considering 80% of people suffering from back pain.

The latissimus dorsi is a large, flat muscle on the back that stretches to the sides, behind the arm, and is partly covered by the trapezius on the back near the midline, the word latissimus dorsi comes from Latin and its means, broadest muscle of the back dorsum means back.

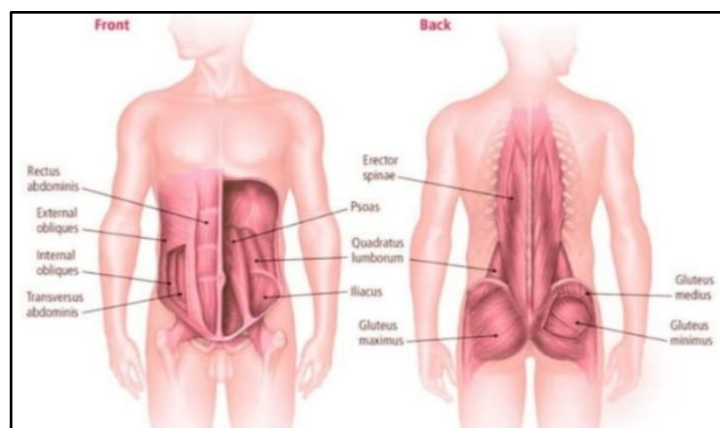


Figure: Muscles of front and back

Latissimus dorsi Muscle

Origin-spinous processes of vertebrae T7-L5, thoracolumbar fascia, iliac crest, inferior 3 or 4 ribs and inferior angle of scapula

- **Insertion**-Floor of intertubercular groove of the humerus
- **Nerve**-thoracodorsal nerve (C6, C7, C8)
- **Artery**-thoracodorsal branch of the subscapular artery.
- **Action**-adducts, extends and internally rotates the arm when the insertion is towards the origin. powerful rotator of the trunk.
- **Antagonist**-deltoid and trapezius muscle.

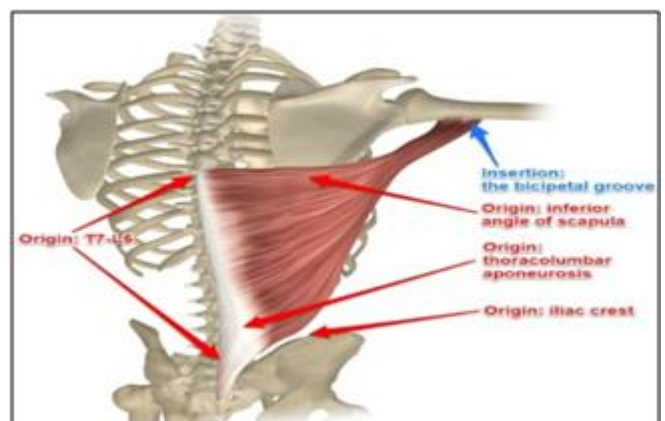


Figure- Origin and insertion of latissimus dorsi muscle

Hypothesis

• Null hypothesis:

There will be no significant difference in GROUP A Latissimus Dorsi Strengthening and Conventional Exercises, Compare to GROUP B Conventional exercises alone In Mechanical Low Back Pain.

• Alternate hypothesis:

There will be significant differences in GROUP A Latissimus Dorsi Strengthening and Conventional Exercises, Compare to GROUP B Conventional exercises alone In Mechanical Low Back Pain.

2. Literature Review

Low back pain as pain originating thoracolumbar region, but reported by patients in either the low back or upper buttocks pain. These pain are mostly chronic in nature. There are some of Literature Review are given below.

[Aditya Sood (2017)] conducted the study, the latissimus dorsi flap is a workhorse for plastic surgeons, being used for many years for soft-tissue coverage of the upper extremity as well as for functional reconstruction to restore motion to the elbow and shoulder. The authors present a case of functional latissimus dorsi transfer for restoration of elbow flexion and review the literature on technique and outcomes.

[Dongre Alpna, Sharma Sanjeev (2007)] Did a study on role of latissimus dorsi in chronic mechanical low back pain due to thoracolumbar dysfunction and found that identification of thoracolumbar dysfunction as a cause of low back pain is recommended in all non-traumatic, chronic, mechanical low back pain. And also that latissimus dorsi strengthening along with core stabilization relieves thoracolumbar related back pain.

[Ebby Waqqash, Rahmat Adnan (2014)] did the study, core stability exercise has become an integral component in the management of patients with lower back pain for the past decade. Core stability exercise is effective in improving pain, function, and activation of tonic core muscle groups among a heterogeneous group of patients with CLBP. Core stability exercise is defined as exercises that activate deep core muscle such as the transverse abdominis (TA) and multifidus.

[Hides, Julie A. et al (2001)] Did a study on the long term effects of specific stabilizing exercises for low back pain. And the concluded that subjects who underwent spinal stabilization exercises had reduction in pain and these exercises led to fewer recurrence of low back pain.

[Joseph D. Fortis, DO (2003)] Did a study on thoracolumbar syndrome in athletes and found that cause of low back pain usually centers on lower lumbar segments and thoracolumbar syndrome tends to be overlooked. Also, thoracolumbar unction is susceptible to extension overload injuries.

[Polly E. bijou, et al (2001)] Reliability of the visual analog scale for pain measurement as assessed by the intraclass coefficient appears to be high. Ninety percent of the pain ratings were reproducible within 9mm. this data suggests

that a visual analog scale is sufficiently reliable to be used to assess acute pain.

[Michelle H. Cameron (1999)] VAS is most useful in the clinical setting when a quick estimate of a patients perceived progress or change in symptoms over time or in response to different activities in treatment intervention is desired.

3. Research Methodology

The research methodology is most important in research as it is the framework for conduction a study. It indicates the general pattern for organizing the procedure together validity data for an investigation for the achievement of stated objective and testing the hypothesis design and method will be used, it includes the research approach, research design, population, study setting, sample and sampling technique, data collection method, development of tool inclusion an exclusion criteria, reliability, plan of the data analysis and description of tool.

A patient is said to thoracolumbar dysfunction when the following points are positive:

- Positive iliac crest point.
- Tenderness over the corresponding facet joints.
- Positive pinch and roll test.
- Tenderness over-involved spinous process.
 - **Group A** Consist of Patient those give Latissimus dorsiStrengthening Exercise and Conventional Exercises.
 - **Group B** Consist of Patient those give Conventional Exercises.

Pain and functional disability level were assessed at the beginning of treatment, during the treatment and after the treatment.

• Position of the patient:

Seated on the stool against a wall, elbows tucked in to the side and flexed.

Action - The elbows are pushed posteriorly against the wall. Push for 10 seconds then relax.



Figure: Latissimus dorsi strengthening (extension exercise)

Bridging

Patient Position-Supine, with knee bent and feet flat on the floor.

Action-while tightening the abdominal muscles and buttocks muscles, lift pelvis up until it comes in line with the knees hold for 10 sec. release and bring back pelvis down.



Figure: Core stabilization exercise (bridging)

Knee to Chest Exercise

• **Position of the patient**

Lying flat on the back with one knee bent. Action:-Slowly bring the knee to the chest, then bring it back down and repeat with other the leg.



Figure: Core stabilization exercise (knee to chest)

Pelvic Rolling Exercise

• **Position of the Patient**

Supine, with knee bent and feet flat on the floor. Action-Roll Knee on right side and face rotates the opposite side, hold for 10 sec, then come back the starting Position. Same repeat with the left side hold.

4. Data Analysis and Result

In the case of a large sample (n> 30), we have studied the test for the difference between two sample means. However, the equivalent small sample test is studied and which is used only when the two independent random samples come from the normal populations having unknown and the same variance.

Table 1: Distribution of VAS according to Mean and Standard deviation (SD)

	Group A		Group B		t value	df	P value
	Mean	sd	Mean	sd			
VAS DAY 1	6.9333	.88372	6.8000	.77460	.487	28	.634
VAS DAY 5	4.6000	.73679	5.2000	.67612	3.154	28	.007*
VAS DAY 10	1.8000	.77460	2.4000	.91026	2.201	28	.045*

*P-value is significant at P<0.05

P-value is insignificant at P>0.05

Table 2: Distribution of ODI according to Mean and Standard deviation (SD)

	Group A		Group B		t value	df	P value
	Mean	Sd	Mean	sd			
ODI DAY 1	18.0000	2.87849	19.9333	3.19523	1.748	28	.102
ODI DAY 5	15.2000	1.56753	16.7333	2.78944	2.182	28	.047*
ODI DAY 10	11.0667	.96115	11.8000	1.01419	2.582	28	.022*

*P-value is significant at P<0.05

P-value is insignificant at P>0.05

5. Discussion

After studying 30 patients having Mechanical Low Back Pain of age group 30-45 years and are divided into 2 groups i.e. Group-A and Group -B. Group -A Patients received Latissimus dorsi Muscle Strengthening along with the Conventional Exercises 3 Sets for 4 weeks and Group -B Patients Conventional Exercises for 4 weeks. When the mean values of pre and postdate of group A and Group B was analyzed. We found that both the groups showed significant improvement in Mechanical Low Back i.e. after completion of 4 weeks of the treatment protocol.

6. Conclusion

The present study was conducted for a period of four weeks on 30 mechanical low back pain patient’s at the department of physiotherapy, peoples college of paramedical sciences Bhopal. The patients were randomly allocated into two groups by means of a lottery method. Group -A Latissimus dorsi muscle strengthening along with the conventional exercises and Group -B only conventional exercises for a period of 4 weeks. Pre and post data were collected and analyzed. The results showed that the both technique are showing significant improvement in mechanical low back pain. Group -A Shows significant improvement in VAS and ODI.

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