

## Original Article

# COMPARISON BETWEEN POSTERIOR TO ANTERIOR MOBILIZATION AND TRACTION SLR ON PAIN AND NEURODYNAMIC MOBILITY IN PATIENTS OF LOW BACK PAIN

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## ABSTRACT

**Background :** Low back pain is one of the most prevalent condition . According to the American Association of Orthopaedic Surgeons about 80 percent of people will have at least one bout with back pain during their lifetime . Various treatments methods have been used like traction SLR , posterior to anterior mobilization etc, but no study was done to compare the effects of posterior to anterior mobilization and traction SLR technique in reducing pain and increasing neurodynamic mobility in patients of low back pain.

**Purpose of study :** To find out the effectiveness of traction SLR and posterior to Anterior mobilization in decreasing pain and increasing neurodynamic mobility of low back pain patients.

**Method :** 20 subjects were taken as per selection criteria which included both male and female between the age of 25 to 45 years. They were randomly divided into two groups, group A (n=10) subjects received traction SLR and group B (n=10) received posterior to anterior mobilization. Range Of Motion and VAS were taken as outcome measurement parameters.

**Result:** Comparison was made between pre and post reading within group using related t – test and between groups by using unrelated t-test for statistical analysis. Result showed statistically significant improvement between pre and post intervention VAS score for both group A and B. Result showed a statistically significant improvement between pre and post intervention ROM in for both Group A and B. Result shows statistically non significant difference between Group A and B in ROM and VAS scores.

**Conclusion:** Traction SLR and posterior to anterior mobilization are effective in improving ROM and pain in patients suffering from low back pain. However there was no statistically significant difference between Traction SLR and posterior to anterior mobilization in improving Pain and ROM in patients suffering from low back pain.

**KEYWORDS:** Traction SLR; Posterior to Anterior mobilization; Neurodynamic mobility

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## INTRODUCTION

Low back pain is one of the most prevalent conditions. According to the American Association of Orthopaedic Surgeons about 80 percent of people will have at least one bout with back pain during their lifetimes. In fact, Americans see their doctors for low back pain

more than any other reason except the common cold and flu. <sup>1-3</sup>

Pain in the lower back can originate from various structures like spine, muscles, nerves or other structures in the low back. The pain may feel like tingling or burning sensation, a dull aching, or a sharp pain, and it often comes with muscle

and stiffness near the spine and sometimes with weakness in the legs or feet.<sup>2,3,4</sup>

Low back pain can be acute or chronic. Acute pain is temporary, lasting less than a month. Chronic pain lasts longer than three months and is often continuous.<sup>9</sup>

The causes of low back pain are numerous and range from the extreme like lifting a heavy object or being involved in an accident, to the very ordinary, like moving too quickly or sitting too long in one position. A number of medical conditions contribute to low back pain, such as; small fractures of the spine from osteoporosis, muscle spasms (very tense muscles that remain contracted) , Ruptured, herniated or degenerating disc, Poor alignment of the vertebrae, Spinal stenosis (narrowing of the spinal canal), strains or tears of the muscles or ligaments that support the back , curvature of the spine and other medical conditions.

A thorough medical history should be taken and physical examination should be performed to evaluate person's pain condition. Various neurological test may be performed for diagnosis alongwith other tests such as discography, computerized tomography, magnetic resonance imaging (MRI), electrodiagnostic procedures, bone scans, thermography and ultrasound imaging.<sup>21</sup>

Various treatments for low back pain are used and often begin with the application of ice and heat. Medications may be administered in conjunction with other therapies. Aspirin, naproxen and ibuprofen may reduce the swelling and inflammation so that the back can heal. For more intense pain conditions, prescription medicines like anticonvulsants, antidepressants or opioids may be used. In addition, patients may be scheduled for physical therapy, electrical stimulation of the painful nerve or pain counseling.<sup>13-17</sup>

If these methods are unsuccessful, another treatment, such as injections to relieve the pain or to destroy a nerve. Other possible treatment approach includes nerve block so that it cannot transmit pain signals. Advance treatment methods include neurostimulation, which involves implanting a device that uses mild electrical impulses to block pain messages

before they reach the brain.

According to the National Institute of Neurological Disorders and Stroke (NINDS), surgery is the last resort; "In the most serious cases, when the condition does not respond to other therapies, surgery may relieve pain caused by back problems or serious musculoskeletal injuries." However the institute states, it may be months following surgery before the patient is fully healed, and he or she may suffer permanent loss of flexibility. Since invasive back surgery is not always successful, it should be performed only in patients with progressive neurologic disease or damage to the peripheral nerves."

## METHODS

### Instrumentation

- Universal Goniometer.
- Treatment Table.

### Selection criteria

#### Inclusion Criteria:

1. Age 25 to 45 years.
2. Limitation of range of SLR.
3. Radiation of pain upto knee.
4. SLR should be atleast 40° .

#### Exclusion Criteria:

1. Pain radiation below knee.
2. Unstable medical conditions.
3. Uncooperative patients.
4. Patients suffering from psychological or psychiatric disorder.
5. Any communication disorder.

**Procedure:** The subjects were screened based on the selection criteria. Demographic data was collected. Assessment of VAS, ROM was done at the beginning and at the end of prescribed protocol. Subjects were randomly allotted into two groups, Group A (n=10) and Group B (n=10). Group A was given Traction SLR and group B was given posterior to anterior mobilization. After three days ROM and VAS of patient's was again checked. Subjects were in supine position for Traction SLR and in prone position for posterior to anterior mobilization.

### Mulligan's Traction Straight Leg Raise

**Technique :** This technique consists of sustained traction applied to the limb with the knee extended. The patient is in supine lying on a very low bed or on the floor and therapist stands facing patient's affected side. Patient actively .

performed the SLR without therapist assistance and the therapist observed the range of SLR. Therapist grasped patient's lower leg proximal to the ankle joint and raised it off the bed to a position just short of the painful range. Therapist held the back of leg in the fold of bent elbow for comfort. Therapist flexed his knees and holds the clasped leg to his chest. When the therapist extends his knees this will effectively apply a longitudinal traction to the leg provided the bed is low enough and the therapist is tall enough. Sustain this traction and undertake a straight leg raise as far as it will go provided there is no pain. If there is pain slightly rotate, abduct or adduct the hip while raising the leg. This pain free SLR with traction was given for three times.

**Posterior To Anterior Mobilization** Subjects received posterior-to-anterior mobilization group (n=10) were treated with the method described by Maitland et al.<sup>5</sup> The subject's position for the mobilization intervention was prone on a treatment table with a small pillow under the abdomen. Therapist applies posterior-to-anterior pressure on the spinous process of each lumbar vertebra using small-amplitude movements<sup>5</sup>. Subjects were asked to report whether they perceived discomfort similar to the symptom. If the subjects did not report any discomfort from the pressure at a particular vertebral level, then the therapist proceeded to the next higher grade of the movement, using slightly larger amplitudes.<sup>5</sup>

Initially, the posterior-to-anterior mobilization intervention was applied to the most painful lumbar segment. Three bouts of 40-second oscillations will be applied to this segment at a rate of approximately 1 to 2 Hz and at the highest amplitude tolerated without the reproduction of symptoms, followed by mobilization of the most painful segment. Two bouts of 40-second oscillations (up to grade IV but short of symptom reproduction)<sup>6</sup> were administered to the remaining lumbar vertebral levels. The total time for the posterior-to-anterior mobilization intervention was approximately 10 minutes.

**Data Analysis:** Twenty subjects were taken. They were divided into two groups. Both group consisted of 10 subjects each. Group A consisted of 4 females and 6 males and group B consisted of 3 female and 7 male subjects. Mean age of

subjects in group A  $39.1 \pm 2.46$  years and group B was  $37.6 \pm 17.96$ .

**Table 1:** Mean and SD of VAS at Pre and Post intervention for Group A & B.

	Group-A		Group-B	
	Pre VAS	Post VAS	Pre VAS	Post VAS
Mean	5.5	4.2	6.2	3.8
SD	0.849	0.632	0.632	0.788

**Table 2:** Mean and SD of ROM at Pre and Post intervention for Group A & B.

	Group-A		Group-B	
	Pre ROM	Post ROM	Pre ROM	Post ROM
Mean	54.2	68.8	50.8	62
SD	4.31	3.88	3.22	5.01

**Table 3:** Comparison was made between Group A and Group B for VAS and ROM Improvement.

	Mean VAS Improvement	Mean ROM Improvement
Group A	1.3	14.6
Group B	2.4	11.2

## RESULTS

Result showed statistically significant improvement between pre and post intervention VAS score for both group A and B. Result showed a statistically significant improvement between pre and post intervention ROM in for both Group A and B. Result shows statistically non significant difference between Group A and B in ROM and VAS scores.

## DISCUSSION

A number of studies have been done to determine the causes of low back pain, W E Hogendoon perform a prospective study to see the effect of high physical work load and low job satisfaction as a risk factor for low back pain.<sup>10,11</sup> Michael S. Kerr, et al concluded in his study on biomechanical and psychosocial risk factors for low back pain that includes a physically demanding job, a poor workplace social environment.<sup>12</sup> Neurodynamics are the indicators of mechanosensitivity of neural tissues. Overall mobility and ability to transmit tension is affected by position of joints axes of movement, compression and entrapment sites of nervous system.

BE. Attie PF et al conducted a single group prospective repeated measures design to find out the reduction in pain intensity following lumbar mobilization and prone press ups in the L5-S1 intervertebral disc for twenty adults with low back pain. The outcomes were measured before and after intervention using numeric pain rating scale. This study records a reduction in pain intensity after posterior-to-anterior mobilization followed by prone press ups, so it is the effective intervention for low back pain .

Goodseel M et al studied the short term effects of lumbar posterior-to-anterior spinal mobilization in individuals with low back pain. Twenty patients were divided in to two groups mobilization group (n=10) and control group (n=10). The outcomes were recorded before and after intervention for changes in pain using visual analogue scale. This study showed reduction in pain intensity following mobilization when compared to control group. Study confirms that spinal mobilization is an effective intervention to reduce pain in low back pain patients. <sup>6</sup>

Sahar M. Adel et al in their review on efficacy of neural mobilization in treatment of low back dysfunctions concluded that SLR stretching in addition to lumbar spine mobilization and exercise was beneficial in improving pain, reducing short-term disability and promoting centralization of symptoms. <sup>18-20</sup>

See Hanrahan et al did a study to find out the effects of joint mobilizations on low back pain. 19 subjects were selected. They concluded that grade 1 and 2 joint mobilizations reduce the subject's pain significantly and increased force production in muscles in low back pain. Spinal mobilization is commonly used manual intervention performed by the physiotherapist to reduce pain and to increase neurodynamic mobility in back pain. A randomized control trial was done. Subjects were divided into two groups. One group received lumbar mobilization while other group was control group. Outcome measures were SLR and PKE test. Result showed a very large effect (d=2.14) on pre and post SLR measurement and a large effect (d=1.6) was also seen on SLRNF after comparison with control group. Present study has revealed many

significant findings. The efficacy of Traction SLR and posterior to anterior mobilization was evaluated by the improvement of VAS scores and ROM in patient suffering from low back pain.

The results of present study are in conformity with the earlier studies. Lews, wood et al performed a randomized controlled trial to investigate the effects of posterior to anterior lumbar mobilization techniques on neurodynamic mobility in the lower limb. They concluded that posterior to anterior lumbar mobilization technique applied to the L4/L5 vertebrae improved the neurodynamic SLR and SLRNF mobility with minimal effect on passive knee extension. Toby Hall et al conducted a study to determine the immediate effects of the Mulligan traction straight leg raise technique. This study concluded that traction SLR is effective in reducing pain and increasing ROM in patients suffering from low back pain. Result of the study shows that there is significant increase in the range of SLR by 11° in subjects with low back pain. <sup>7,8</sup> Present study also compared the effects of two interventions and concludes that there was non significant difference in ROM and VAS scores in groups.

## CONCLUSION

Traction SLR and posterior to anterior mobilization are effective in improving ROM and pain in patients suffering from low back pain.

However there was no statistically significant difference between Traction SLR and posterior to anterior mobilization in improving Pain and ROM in patients suffering from low back pain.

**Acknowledgement** - None.

**Conflict of Interest** - There is no conflict of interest.

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**Ethical Clearance** - The study has been approved by the relevant ethical committee.

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