

EFFECTIVENESS OF LOW LEVEL LASER THERAPY VERSUS MECHANICAL TRACTION FOR TREATING LUMBAR RADICULOPATHY AMONG PHYSIOTHERAPIST

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Abstract-

Introduction and aim:

Lumbar radiculopathy is described as lower back pain that radiates to the lower limb along a specific lumbar nerve due to a pathological process like inflammation or mechanical compression of that nerve root. The main causes of it are nerve root foraminal stenosis or lumbar disc prolapse squeezing the nerve root. It's most common in medical profession especially in physiotherapist. Exercises were used as a treatment in earlier research. This study uses modalities such as low level laser and lumbar traction for treating Lumbar radiculopathy. Musculoskeletal diseases including back pain can be treated with low level laser treatment (LLLT). It produces no vibrations, noise, or heat. It is also known as bio stimulation or photobiology. In addition to acting as an anti-inflammatory, LLLT is thought to influence how elastic tissue cells (fibroblasts) operate. Lumbar traction is described as diversion or partition of the vertebral bodies, the diversion and cruising of the facet joints, the tensed muscles of the labra structures of the spine segment, the broadening of the intervertebral foramen, the straightening of the spinal curves, and the stretching of the spinal musculature. Hence the main purpose of the study is to establish the effectiveness of low level laser therapy versus mechanical traction for treating lumbar radiculopathy among physiotherapist.

Materials and methods: A total of 30 samples will be selected based on inclusion and exclusion criteria. Subjects was randomly divided into two groups, Control group and experimental group. Control group with n=15 subjects were given low level laser therapy, while Experimental group with n=15 subjects were given Lumbar traction. Duration given for both control and experimental group was 10 min per day. Both group received treatment for four weeks, 5 days per week. The pre-test and post-test was obtained through Modified schober test, NPRS scale, Roland Morris disability questionnaire.

Result: The pre and post-test mean values of control and experimental group of MST was 6.467 and 6.333, 4.620 and 4.293, NPRS was 8.147 and 7.627, 2.660 and 2.240, RMDQ was 18.20 and 18.73, 6.07 and 5.40.

Conclusion: The study showed substantial clinical and Significant effect on reducing pain, increasing ROM and reducing disability for subjects with lumbar radiculopathy. As a result, it is suggested that Mechanical traction can be used in clinical practice to reduce back pain.

Key words: Lumbar radiculopathy, Traction, Modified Schober test.

Introduction:

Lumbar radiculopathy is described as lower back pain that radiates to the lower limb along a specific lumbar nerve due to a pathological process like inflammation or mechanical compression of that nerve root. The main causes of it are nerve root foraminal stenosis or lumbar disc prolapse squeezing the nerve root. The prevalence of low back pain among physiotherapists has been observed to range from 57 percent over a lifetime, 45 percent over a year, 52 percent overall incidence, percent overall incidence in a mixed sample of 67 percent physiotherapists. In this young, racially diversified, and physically active population, lumbar radiculopathy is more common than many other degenerative disorders. A particular study found that white race and female sex both increased the likelihood of having lumbar radiculopathy. But growing older appears to be one of the most important independent risk factors for this condition. When physiotherapists care for dependent or immobile patients, they may be exposed to a variety of mechanical stresses that contribute to lumbar radiculopathy. The most significant risk factors for lumbar radiculopathy include age, sex, work experience, obesity, sedentary lifestyle, psychological stress, manual mobilization, patient care, and inadequate ergonomics education. Weight lifting, the work environment, repetitive motion patterns, mechanical pressure, uncomfortable posture, and bending and twisting are all occupational risk factors for lumbar radiculopathy. Lumbar radiculopathy is frequently described by patients as electric, burning, or acute. In addition to numbness or tingling, the pain is bilaterally positioned at the posterior beltline and radiates in a sharp, shooting fashion down the low back, buttocks, and down the leg. Walking, lying down, taking a nap, and lying down all help to reduce the discomfort, which is aggravated by sitting, extended standing, bending, or twisting movements. Low-level laser therapy (LLLT) uses non-thermal laser irradiation to target painful areas and is a very uncommon, non-invasive treatment for lumbar radiculopathy. A painless and non-invasive treatment option is

low-level laser therapy. Numerous acute and ongoing painful diseases are treated with it. This study used low-level laser therapy (LLLT) on patients with lumbar radiculopathy to examine the relationship between pain severity, functional impairment, and range of motion. An old-fashioned method of treating persistent lumbar radiculopathy is lumbar traction. The following effects of properly applied traction include distraction or separation of the vertebral bodies, distraction and gliding of the facet joints, tensing of the ligamentous structures of the spinal segment, widening of the intervertebral foramen, (straightening of spinal curves, and stretching of the spinal musculature). The main purpose of the study is to establish the effectiveness of low level laser therapy versus mechanical traction for treating lumbar radiculopathy among physiotherapist.

2. METHODOLOGY:

- **Study design:** Experimental study.
- **Sampling technique:** Convenient sampling.
- **Duration:** 4 weeks.
- **Inclusion criteria:** Age:18-30, Both male and female were included, Positive Radiculopathy symptoms, Positive SLR, Roland Morris Disability Questionnaire score more than 15
- **Exclusion criteria:** Recent trauma, Open wound, Lumbar stenosis, Acute infective and inflammatory condition, Autoimmune disorder

3. PROCEDURE:

A convenient sample of 30 subjects working as physiotherapist with low back pain were recruited based on the inclusion and exclusion criteria. Subjects were randomly divided into two groups, Control group and experimental group. Control group with 15 subjects were given low level laser therapy, while Experimental group with 15 subjects were given Lumbar traction. Duration given for both Control and experimental group was 10 minutes per day. Both groups received treatment for 4 weeks, 5 days per week. The pre-test and posttest was obtained through Modified schober test, NPRS scale, Roland Morris disability questionnaire

CONTROL GROUP: LOW LEVEL LASER THERAPY WITH ERGONOMIC ADVICE:

The patient was instructed to rest in prone position and the therapy was given for 10 minutes with low level laser therapy of wavelength range of 600 to 1000 nm. The area other than the treatment area has been covered. For safety purpose the goggles has been provided to the therapist to protect the eyes.

LUMBAR TRACTION WITH ERGONOMIC ADVICE:

The patient was instructed to rest in supine position on traction couch. The therapy was given for 10 minutes with lumbar traction. According to the patient weight the load had been increased or decreased.

ERGONOMIC ADVICE :

- Patient to sit in Ergonomic chair. Consider utilizing a chair with such a back that supports lower (lumbar) back's curve.
- Place thighs parallel to the legs at hip level as recline on the chair.
- Feet should be properly supported on the ground or a foot rest.
- While treating the patient the couch should be at waist level.
- Therapist should be in walk stand position while treating the patient.
- While treating the patient maintain the posture straight.

4. OUTCOME MEASURES:

Modified schober test:

- The modified schober test used to measure the lumbar flexion and extension.
- The subject's PSIS's inferior margin is touched by the examiner's thumbs.
- Along the center of the lumbar spine, parallel to the PSIS, a mark is made with ink (lower land-mark).
- The examiner makes a second mark 15 cm over the first one while firmly pressing the tape against the subject's skin (higher landmark).
- Then, without making the discomfort worse, the client is instructed to actively bend their trunk in the anterior direction.
- Next, a measurement is made of the new separation between both the lower and upper land-marks (27).

NPRS:

- In order to evaluate pain, people frequently utilize the Numeric Pain Rating Scale (NPRS).
- Responsiveness indices can be used to interpret changes in the NPRS over time(28).
- Higher scores indicate more intense pain; scores range from 0 to 10.(29).

Roland Morris Disability Questionnaire:

- Using comments from the Sickness Impact Profile, the Roland-Morris Disability Questionnaire (RMDQ)
- A self-completed assessment of disability for patients with low back pain, was created(30)
- The score runs from 0 (no impairment) to 24 (max. disability).(31)

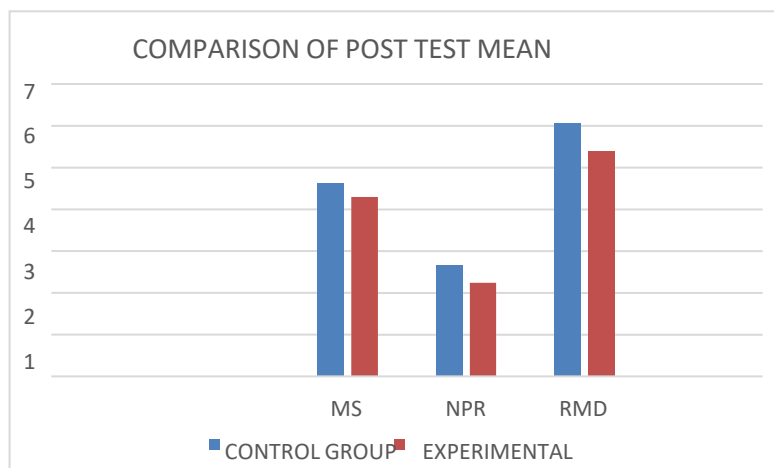
5. STATISTICAL ANALYSIS:

The statistical analysis done on t-test calculator. Intended to test the pre test, post test, mean and standard deviation provided for both Control and experimental group.

Table 1: Comparison between the post-test mean values of MST, NPRS, RMDQ for Control group and Experimental group

PARAMETER	CONTROL GROUP	EXPRIMENTAL GROUP	T-VALUE	P-VALUE
MST	4.620	4.293		
NPRS	2.660	2.240	2.2460	0.0001
RMDQ	6.07	5.40		

Graph 1: Comparison between the post-test mean values of MST, NPRS, RMDQ for Control group and Experimental group



6. RESULT:

From statistical analysis made with quantitative data indicated statistically significant differences in the values of Control group and Experimental group.

Table 1 compares the post-test mean values of control and experimental group of MST was 4.620 and 4.293, NPRS was 2.660 and 2.240, RMDQ was 6.07 and 5.40

7. DISCUSSION:

The purpose of this study is to find the effect of low level laser therapy Versus mechanical traction with ergonomic advice for treating lumbar radiculopathy among physiotherapist. The comparison is recorded over the course of a week. Modified Schober's test, NPRS Scale, Roland Morris Disability Questionnaire from both before and after therapy were used to gauge the outcomes. Positive effects were significantly greater in mechanical traction with ergonomic advice than the low-level laser therapy with ergonomic advice. The main findings of this study are, treatment of mechanical traction with ergonomic advice group showed a increase rate of reduction of low back

pain than the treatment of low level laser therapy With ergonomic advice. Both groups showed improved function ability and significant reduction of pain and increase in range of motion. When spinal nerve roots are impinged by any of the disorders, such as spinal canal constriction, disc protrusion, spondylolisthesis, and other degenerative conditions, lumbar radiculopathy results. Lumbosacral spine radiculopathy is a disorder that has significant social repercussions. By reducing significant pressure or contact pressures from sensitive neural tissue, vertebral separation may alleviate radicular discomfort⁽³⁰⁾.

The lumbar spine can receive a distractive force from lumbar traction, and patients who receive this force have an instantaneous response after traction. Members of the chartered society of physiotherapy, employers, and the profession itself face a major problem with musculoskeletal ailments. For employers, there are both direct and indirect costs of handling a problem that not only affects the practitioner but also has ramifications for patient care and retention and recruitment⁽³¹⁾.

The goal of this study was to compare the effectiveness of low level laser therapy versus mechanical traction with ergonomic advice for treating lumbar radiculopathy among physiotherapist. This contrast is shown throughout the course of four weeks. Modified Schober's test, NPRS Scale, Roland Morris Disability Questionnaire was used to determine the outcome measures. According to the statistical analysis, the difference between the pre-test and post-test score for both Control group and Experimental group is significant.

Individuals pre and post-test values are identified independently, and their respective mean values for both groups are determined. Using descriptive and inferential statistics, the collected data is tabulated and evaluated. The mean and standard deviation are applied to all parameters. Significant differences between pre and post treatments data were analysed using a paired t-test. For both Control group and Experimental group, the unpaired t-test was employed to examine significant differences in post-test values between the two groups.

The goal of this study is to compare the effectiveness of low level laser therapy versus mechanical traction with ergonomic advice for treating lumbar radiculopathy among physiotherapist. Both groups experienced considerable modifications. According to statistical analysis, Experimental group with mechanical traction with ergonomic

advice is more effective reduction of low back pain than Control group with low level laser therapy with ergonomic advice.

8.CONCLUSION:

According to the findings, the Experimental group with lumbar traction along ergonomic advice is more effective than the Control group with low level laser therapy along ergonomic advice. It is discovered that traction therapy has a substantial clinical and statistical effect on reducing back pain in condition of lumbar radiculopathy. As a result, it is suggested that this procedure be used in clinical practice to reduce back pain.

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