

## Original Article

# EFFECTIVENESS OF INTERMITTENT PELVIC TRACTION VS INTERMITTENT PELVIC TRACTION WITH SELF NEURAL MOBILIZATION ON LOW BACK PAIN – A COMPARATIVE STUDY

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## ABSTRACT

**Background:** Low Back pain is common clinical condition encountered in a day to day Physiotherapy practice. Very few author has so far documented the efficacy of self neural mobilization ,but no literature available SNM during Intermittent Pelvic Traction. Hence to find out the effect of same this study is done. **Materials and Methods:** Pre & Post Test Experimental Design, Physiotherapy Out Patient Department, MADHA Medical College Hospital and Research Centre, Kundrathur – 600069. **Participants and Intervention:** 30 subjects, Two IPT protocol (with and without Self Neural Mobilization) **Procedure:** 30 subjects were randomly sampled and divided into 2 groups (Group A & B). Group A received only IPT (20 minutes, 20 seconds – Hold time, 5 seconds-rest time) whereas Group B received IPT and self Neural Mobilization( Active Ankle Plantar & Dorsi flexion movements) (only during Rest time). **Results:** Were analyzed with Visual Analogue Scale, Oswestry Disability Index, when comparing the Pre test and Post test values of VAS and ODI there is significant difference at 95% interval (P < 0.05). **Conclusion:** Self Neural Mobilization during Intermittent Pelvic Traction is effective in reducing Low back pain.

**KEY WORDS:** INTERMITTENT PELVIC TRACTION; SELF NEURAL MOBILIZATION(SNM); VAS & ODI.

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## INTRODUCTION

Lumbar traction is one of the oldest treatment modality for LBP. Hippocrates described lumbar traction in various forms has been used for centuries and continues to be used in today clinical environment. Recent clinical studies, systematic review of literature, and evidence based guidelines have concluded that preponderance of evidence fails to support the lumbar traction as an effective treatment for patients with LBP.

Still there are literature supports the positive effect of traction on LBP; some are reported the lack of methodological design of previous research, have made the literature regarding lumbar traction still under debate.

The use and description of neural mobilization to influence the mechanical properties of peripheral nerve gained popularity from the late 1970s through 1980s.

However the underlying mechanism associated with clinical improvements following neural mobilization remain unclear.

There are many theories have been postulated including physiological effects (removal of intraneural edema) central effects (reduction of dorsal horn and supraspinal sensitization) and mechanical effects (enhanced nerve excursion)

Many studies examined the influence of neural mobilization exercises on nerve mechanics in cadaver.

**Copiers et al** examined the median nerve excursion between different types of nerve gliding exercises (including sliders and tensioners) Sliders utilizes combination of joint movements to encourage peripheral nerve excursion by increasing elongation at one end of nerve bed, thereby creating tension in the nerve from that end while simultaneously releasing tension from other end of nerve. In doing so excursion is promoted without increasing nerve tension.

Sliders produce greater amount of median nerve excursion compared to tensioners. It has also been shown that significantly less nerve excursion occurred during nerve gliding exercises initiated from one end of nerve bed using a single joint movement compared to sliders.

Neural mobilisation exercises derived from neurodynamic test such as slump test, SLR test have been advocated in clinical texts and as a result of published clinical trials.

Neurodynamic mobilization technique often used clinically to restore nerve mobility and decrease pain.

**Richard F. Ellis PT Phd** has demonstrated in vivo Measurement of sciatic nerve excursion in normal healthy participants during different types of neural mobilization exercises.<sup>26</sup>

Patients with signs of nerve root irritation represent a sub-group of those with low back pain who are at increased risk of persistent symptoms and progression to costly and invasive management strategies including surgery.

A period of non-surgical management is recommended for most patients, but there is little evidence to guide non-surgical decision-making. We conducted a preliminary study examining the effectiveness of a treatment protocol of mechanical traction with Self Neural Mobilization (SNM) for patients with low back pain and signs of nerve root irritation.

To observe and evaluate the clinical effects of Intermittent Pelvic Traction with Self Neural Mobilization (Active Ankle Dorsi and Plantar flexion) on Low Back Pain. Low Back pain is

common clinical condition encountered in a day to day Physiotherapy practice. NO author has so far documented the efficacy of SNM (Active ankle movements) during Intermittent Pelvic Traction. Hence to find out the effect of same this study is done.

## **MATERIAL AND METHODS**

A comparative Study was conducted with 30 subjects by simple random sampling at MADHA Physiotherapy Clinic, MADHA Medical College, Hospital And Resesearch centre, kovur, Thandalam.

**Inclusion Criteria<sup>7</sup>:** Pain and/or paresthesia in the lumbar spine with a distribution of symptoms that has extended distal to the gluteal fold on at least one lower extremity within the past 24 hours. Oswestry disability score of at least 20%, Age at least 18 years and less than 60 years, At least one of the following signs of nerve root compression:

1. Positive ipsilateral or contralateral straight leg raise test (reproduction of leg symptoms with straight leg raise < 70 degrees)
2. Sensory deficit to pinprick on the ipsilateral lower extremity
3. Diminished strength of a myotome (hip flexion, knee extension, ankle dorsiflexion, great toe extension, or ankle eversion) of the ipsilateral lower extremity
4. Diminished lower extremity reflex (Quadriceps or Achilles) of the symptomatic lower extremity

**Exclusion Criteria<sup>7</sup>:** Red flags such as , tumor, metabolic diseases, RA, osteoporosis, spinal compression fracture, prolonged history of steroid use, etc. central nervous system involvement such as cauda equina syndrome (i.e., loss of bowel/bladder control or saddle region paresthesia) or the presence of pathological reflexes (i.e., positive Babinski) complete absence of low back and leg symptoms when seated, Recent surgery (< 6 months) to the lumbar spine or buttocks, Recent (< 2 weeks) epidural steroid injection for low back, Current pregnancy, Inter vertebral Disc Prolapse, Inability to comply with the treatment schedule.

**Materials: Traction Unit<sup>8</sup>.** With intermittent mode for 20 minutes durations followed by 20 seconds and 5 Seconds Hold and Rest times respectively.

**Participants:** Subjects eligible for the study if they were aged between 18 and 60years and must have reported LBP ,with the presence of associated lower extremity pain/paraesthesia that had an average intensity of greater than 4 on VAS.In addition ,all subjects had to have a score of greater than 20% on the ODI questionnaire.

**Subjects screening and intake measures** Prior to the admission to the study subjects underwent a screening procedure to verify the entry and exclusion criteria. Subjects who met the entry and exclusion criteria, and provided written informed consent, were enrolled in the study. At this time the subjects completed pre test measurements. Each subject was scheduled for 15 days of IPT of 20 minutes.

**Interventions<sup>21</sup>** Patients were allowed to continue with their regular pain medication, but other co-interventions (eg injections ,massage,exercises,physical modalities)were not allowed.The treatment series could be ended if a patient was free of symptoms before the last session or if the pain increased during two consecutive treatment sessions.After the patients lay down on the traction table in supine position ,the canvas traction braces were attached around the iliac crest and the lower thoracic cage.

In the Group A the patients were explicitly asked to tell when they felt distinct pulling from the braces. After unlocking the traction table the traction force was slowly increased from 30 % of total body weight until the patient indicated a distinct but tolerable pulling. The maximum force used was set at 40% of the total body weight. Group A ( 15 subjects ) received only IPT (20 minutes, 20 seconds - Hold time, 5 seconds - rest time)

In the Group B the patients were explicitly asked to tell when they felt distinct pulling from the braces.

After unlocking the traction table the traction force was slowly increased from 30 % of total body weight until the patient indicated a distinct but tolerable pulling. The maximum force used was set at 40% of the total body weight. Group B ( 15 subjects ) received IPT (20 minutes, 20 seconds - Hold time, 5 seconds - rest time).The patients in Group B advised to do active ankle dorsi and plantar flexion during the rest time at their own speed. Post test measurements taken after the Intervention. **Measurement Tools:** Visual analogue scale (VAS)<sup>10</sup>, Oswestry disability index (ODI)<sup>11</sup>

## RESULTS

### Comparison of VAS between Group A and Group B(Table-1):

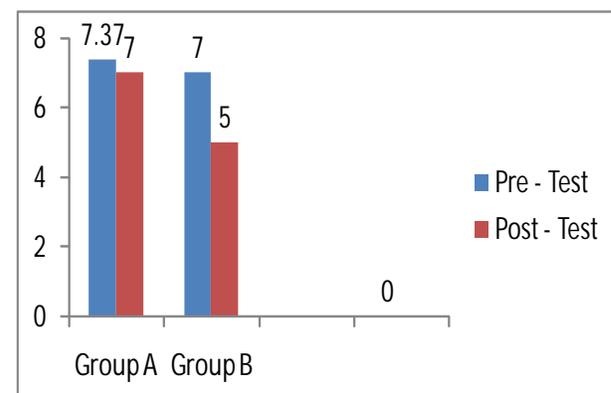
VAS	Type	Mean	SD	Std Error Mean	t-value	Significant level
Group A	Pre test	1	7.37	0.65	1.522	0.139(NS)
	Post test	7.3	0.845	0.13603		
Group B	Pre test	2	7	1	14.929	0.000***
	Post test	5	0.845	0.2146		

\*\*\* :p<0.05

The above table reveals the mean, standard deviation, independent t-test and significant p-value of VAS between pre test and post test in Group A and Group B.

The mean value of Group B shows statistically significant result between the pre test and post test(p<0.05).

### Comparison of VAS between Group A & B (Graph -1):



**Comparison of ODI between Group A & B(Table-2):**

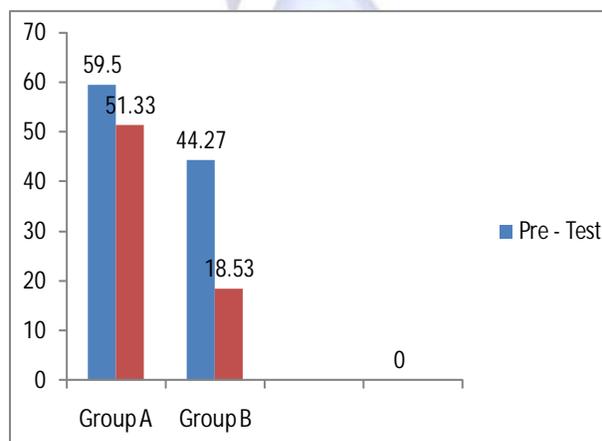
ODI	Type	Mean	SD	Std Error	t-value	Significant level
				Mean		
Group A	Pre test	59.6	8.626	0.13603	1.898	0.068(NS)
	Post test	51.33	14.495			
Group B	Pre test	44.27	9.938	0.2146	7.917	0.000***
	Post test	18.53	7.726			

\*\*\*:p<0.05

The above table reveals the mean, standard deviation, independent t-test and significant p-value of ODI between pre test and post test in Group A and Group B.

The mean value of Group B shows statistically significant result between the pre test and post test (p<0.05).

**Comparison of ODI between Group A and Group B(Graph-2).**



When comparing the Pre test and Post test values of VAS and ODI there is significant difference between the two scales at 95% (P<0.05) in Group B than in Group A.

**DISCUSSION**

The results suggested in Group A with Only IPT co-relates with previous studies which concluded that traction is NOT effective (P < 0.05) in LBA.<sup>13</sup>

Where as in Group B, IPT with SNM (Active Ankle Movements) there is a decrease in Pain and ODI. The underlying causes for this may be the sensitization of Nerve root pain by performing Active DF.<sup>14</sup>

Peripheral nerves straighten and stretch in order to accommodate increases in bed length during joint movements<sup>23</sup>. The pain relief may also due to the Strain of Peripheral Nerves during Ankle movements. However it can be confirmed only by the Diagnostic Ultra sound which shows the neural mobility.<sup>22,25</sup>

The IPT along with active ankle movement nerve mobility and stress/strain characteristics in lower extremities improved; and mechanisms and consequences of trauma on nerve microcirculation as well as influence on axoplasmic and lymphatic flow within peripheral nerve identified. **Mathew carrol et al** quantified the degree of longitudinal tibial nerve excursion as the ankle moved from dorsiflexion to plantar flexion which supports the study result.

**Larissa sale teles versa et al** conducted study in leprosy patients who are undergoing the technique of neural mobilization had improvement in electromyography function and muscle strength, reducing disability degree and pain. Physical therapy management of peripheral nerve dysfunction as reported by **Elvey** and **Butler** is reviewed. Guidelines for appropriate principles of clinical examination and treatment are outlined as well as possible areas for future clinical research

It is interesting to note that even though studies stating the lack of efficiency of Lumbar traction<sup>15</sup> for LBA, it is still a widely used modality in a clinical set up.<sup>14</sup>

Hence, it must be emphasized that Spinal traction is only a part of the total management – treatment regimen, which includes other forms of Physical therapy. Without a total management program, Spinal traction, like many other methods has little chance of long range benefit.<sup>2</sup>

The results suggested this approach may be effective, particularly in a more specific sub-group of patients. The aim of this study will be to examine the effectiveness of treatment that includes traction for patients with low back pain and signs of nerve root irritation, and within the pre-defined sub-group.

Traction therapy effectively mitigates pain, enhances joint flexibility, and improves the quality of life of patients with lumbar pain. The equipment required to administer intermittent pelvic traction is simple and treatment technique is simpler to perform by the patient themselves.

## CONCLUSION

Self Neural Mobilization (Active Ankle dorsi & plantar flexion movements) during Intermittent Pelvic Traction is effective in reducing LBP with radiculopathy. However this requires confirmation by further investigation.

**Limitations:** Present study is limited in the following areas: study was conducted in short duration, no control group, short duration symptoms, no radiological examination.

**Further recommendations:** Similar study can be carried out with the Larger sample group, study design shift to prospective, Shoe modification, different age group, Combination therapies such as UST and Cryotherapy, Iontophoresis, Moist heat.

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