



To Compare the Effect of Neural Mobilization with Hot Fomentation Vs TENS with Hot Fomentation in Sciatica

Dr.Akshita Nautiyal¹, Dr.Sharda Sharma²Prof. (Dr.) Niraj Kumar³, Dr. Mahesh Kumar Soul⁴, Prof. (Dr.) Deepak Raghav,⁵ Dr. Anju Khanna⁶

1. **Researcher** Physiotherapy Department, Shri Guru Ram Rai School of Paramedical & Allied Health Sciences, Shri Guru Ram Rai University
2. Ph. D. Scholor , MPT, Associate Professor Physiotherapy Department, Shri Guru Ram Rai School of Paramedical & Allied Health Sciences, Shri Guru Ram Rai University,
3. Ph. D (Physiotherapy), MPT, MHA, Professor, School of Paramedical & Allied Health Sciences, Shri Guru Ram Rai University, Patel Nagar , Dehradun.,
4. Dr. Mahesh kumar shou, Sr. Professor Swasthya kalyan college (RUHS) jaipur,
5. Ph. D, MPT, Principal/Professor Physiotherapy Department, Santosh Deemed University, Gaziabad, UP,
6. MPT (cardio),Certificate Course in Yoga, Level 2 Wheelchair certified trainer by WHO.Senior physiotherapist at Latika.

Corresponding Author- Prof. (Dr.) Niraj Kumar, Ph. D (Physiotherapy), MPT, MHA, Professor Physiotherapy Department, School of Paramedical & Allied Health Sciences, Shri Guru Ram Rai University, Patel Nagar , Dehradun.,

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ABSTRACT:

Introduction: Sciatica can significantly impair a person's quality of life and is typified by acute pain and paresthasias in the sciatic nerve distribution or related lumbosacral nerve root.It is more of a symptom than a specific diagnosis.

Need Of Study:

Although various studies has been done using neural mobilisation, hot fomentation and TENS in treating patients with sciatica but none has done the comparative study between these ,so by the study which I will be doing ,I want to see if the combination therapy workseffectively or not.

Methodology: 30 patients with acute sciatica who will be willing to take treatment for four weeks session after a written consent will be taken .15 patients will be included in group firstand 15 in group second.Simple random sampling is applied and 30 patients are divided into two groups.15 patients will be selected randomly and will be included in group first and 15 patients in the other group.The study was conducted in Shri Mahant Indresh Hospital , Patel nagar, Dehradun.The duration of study was of 12 weeks. Each group's patients are called alternately 3days / week.

Conclusion: The mean difference in group A is more and in group B is less which indicatesbetter results in group A which is given neural mobilization with hot fomentation as a treatment protocol.The post mean in group A is found to be much less than in group B indicating better recovery in the prior group.Further,the t values in group A is found to be more than in group B indicating more difference in pre and post treatment means as well asbetter result.

1. Introduction

Sciatica is referred to by a variety of names in the literature, including radiculopathy, nerve root discomfort

and nerve root inflammation or entrapment. Sciatic pain is typically describedas leg discomfort that radiates into the foot and toes, typically below the knee. It usually approximates the dermatomal distribution of the afflicted



nerve root (often L5, S1) and is sometimes accompanied with numbness or pins and needles in the same region. Although it had been widely believed that most sciatica patients have a very favorable outcome and naturally resolve their symptoms, research shows that they have a less favorable outcome than LBP patients, a more persistent and severe type of pain, use more health resources, and experience longer periods of disability and absence from work.⁽¹⁾

Muscle weakness and altered reflexes are two additional clinical indications of neurologic impairment that could be present. Like LBP, sciatica is a symptom rather than a precise diagnosis, however common pathologies that can result in sciatica include lumbar disc herniation and lumbar canal or foraminal stenosis. Additionally, there are a few uncommon causes of sciatica, such as tumors, cysts, or other extraspinal causes. In most instances, it is thought that the major source of symptoms is inflammation brought on by irritation or compression of the afflicted nerve root by its surrounding tissues. This study indicates improvement in pain and restoring normal range of motion in individuals with sciatica and provides recommendation in advancing and accelerating progress in the rehabilitation treatment of sciatica by applying neural mobilisation with hot fomentation and TENS with hot fomentation.

Neural mobilization is used to treat adverse neuro dynamics. The primary goal is to restore the dynamic balance between the relative movement of neural tissues and surrounding mechanical interfaces, allowing for lower intrinsic pressures on the neural tissue and promoting optimal physiological function.⁽²⁾

Neural mobilization targeting the sciatic continuum improved hip flexion and pain levels in patients with neurogenic lower extremities pain. Neck motions, especially flexion and extension, alter the position and tension in the lumbar spinal cord and nerve roots.⁽⁴⁾

TENS units stimulate peripheral nerves via skin surface electrodes at well-tolerated intensities and are capable of being self-administered.⁽³⁾ Physiotherapists commonly employ Transcutaneous Electrical Nerve Stimulation (TENS) as a non-invasive pain relief method for sciatica.⁽⁵⁾ TENS devices are battery-powered and produce biphasic pulses.⁽⁹⁾

Hot fomentation has been found to reduce pain in patients with sciatica.^(7,8)

Aim-of Study

- ✧ The aim of the study is to reduce the pain and range of motion in patients with sciatica. Objective Of Study
- ✧ The objective of study is to compare the effectiveness of hot fomentation with neural mobilisation and hot fomentation with TENS in patients with sciatica.

Need Of Study

Although various studies have been done using neural mobilisation, hot fomentation and TENS in treating patients with sciatica but none has done the comparative study between these, so by the study which I will be doing, I want to see if the combination therapy works effectively or not.

2. Methods

Total 30 patients with acute sciatica who will be willing to take treatment for four weeks session after a written consent will be taken. 15 patients will be included in group first and 15 in group second. Simple random sampling is applied and 30 patients are divided into two groups. 15 patients will be selected randomly and will be included in group first and 15 patients in the other group. The materials used were Couch, TENS modality, hydrocollator, pillows, towel, plastic wraps, stopwatch. The study was conducted in Shri Mahant Indresh Hospital, Patel nagar, Dehradun. The duration of study was of 12 weeks. Each group's patients are called alternately 3 days / week. The inclusion criteria considered was Patients diagnosed with the Sciatica (4 to 12 weeks).

Age Group: 20-50 years, Patients who were to comprehend commands, Willingness to Participate, VAS score between 3 to 6, Motivation: the patient demonstrates appropriate desire and commitment to treatment, including traumatic causes patient having prolapsed disc (type 1 and 2). Exclusion criteria was Patient having prolapsed intervertebral disc (Type III & IV), Patient having spinal instability (osseous or ligamentous), Patient having previous spinal surgery, Patient having infection and acute inflammation, Patient having severe osteoporosis, Patient having tumours of the



nervous system and spinal cord, Patient having history of psychological or psychiatric illness ,Patients having Benign Paroxysmal Positional Vertigo ,Vestibular dysfunction ,Any lower limb pathology that may directly affect the outcome measures.

OUTCOME MEASURES: VAS scale and Oswestry disability index.

PROCEDURE:

30 patients following the inclusion criteria were included in the study after taking a written consent from the patient. Patients were made aware of the research study and the procedure to be followed. Patients were divided into two groups randomly; each group consist of 15 patients of both the genders. Before starting the intervention, the patients were assessed through VAS scale and Oswestry disability index. Their respective scores were noted down prior to the treatment.

Group A receives 15 minutes hot fomentation prior to neural mobilization. Neural mobilization technique:

1. Position of the patient : side lying and on the side to be tested Position of therapist : on the side to be tested the therapist takes the painful side’s hip into flexion and knee into extension. The therapist stops at the point where neurological symptoms appear .The therapist ask the patient to flex the neck and takes the ankle of patient into planter flexion simultaneously and vice versa [Figure:1].



Figure:1: Application of neural mobilization in side lying position

2. Application of neural mobilization

Position of patient : high sitting on a couch

Position of therapist : standing in front of the patient.

The therapist ask the patient to straighten the leg (painful side) and dorsiflexes the ankle along with neck extension simultaneously [Figure:2].



Figure:2: Application of neural mobilization in high sitting position

3. Application of neural mobilization

Position of the patient : supine lying

Position of the therapist : on the side to be treated

The therapist commands the patient to flex the hip of the side to be treated and puts both the hands behind the knee, pull the foot back and lift the leg till the patient feels some tension in the back of the thigh. the patient is asked to lower the leg slightly from the point of maximum tension and pump the foot 5 times back and forth .the leg is pulled down in the end [Figure:3].



Figure:3: Application of neural mobilization (self)

Group B is given hot fomentation for 15 minutes followed by TENS for 20 minutes.



Figure:4: Patient receiving hot fomentation prior to TENS



Figure:4: Patient receiving TENS

Post assessment on the basis of outcome measures was taken to find out the improvement in each case. The study was of 12 weeks duration, 3 days per week alternatively at physiotherapy department in Shri Mahant Indresh Hospital, Dehradun.

3. Results

The data was analysed using statistical software JASP version 0.17.3.

To analyse the difference of VAS and Oswestry disability index in group A and B paired t test was applied. The p values < 0.001 in group A and group B were extremely significant.

GROUP A (Neural mobilization with hot fomentation)

DESCRIPTIVE ANALYSIS	VAS (PRE)	VAS (POST)	ODI (PRE)	ODI(POST)
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MEAN	6.467	2.333	50.4	20.4
SE OF MEAN	0.307	0.211	1.319	1.146
STANDARD DEVIATION	1.187	0.816	5.11	4.437

Table: 1 showing descriptive analysis of group A (pre and post)

MEAN DIFFERENCE(GROUP A) = 30

GROUP B (TENS WITH HOT FOMENTATION)

DESCRIPTIVE ANALYSIS	VAS (PRE)	VAS (POST)	ODI(PRE)	ODI(POST)
MEAN	6.467	4.333	49.933	34.133
SE OF MEAN	0.307	0.252	1.409	0.822
STANDARD DEVIATION	1.187	0.976	5.457	3.182

Table 2 showing descriptive analysis of group B (pre and post)

MEAN DIFFERENCE(GROUP B) =

15.8

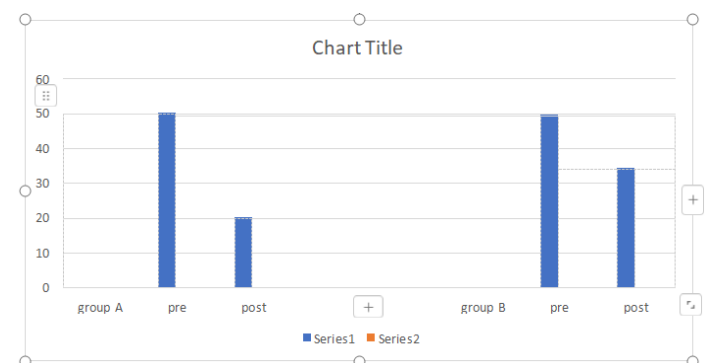


Fig.1 showing pre and post mean of group A and group B (for ODI)

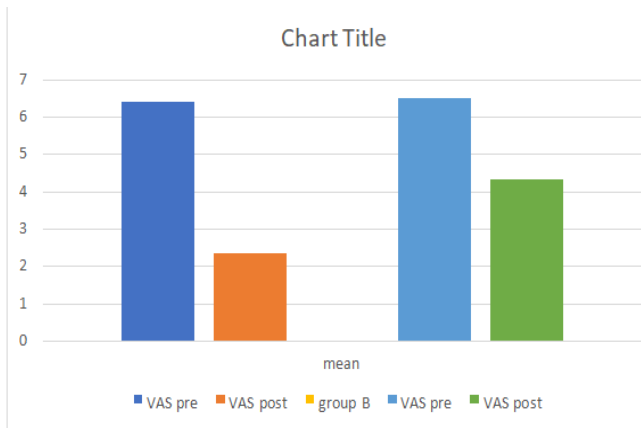


Fig.2 showing mean of group A and group B (FOR VAS SCALE)

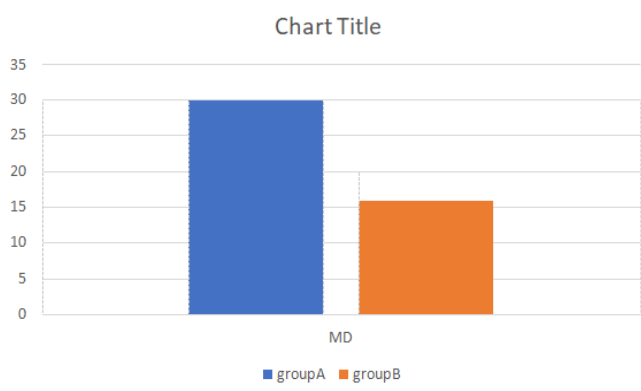


Fig.3 showing MD(mean difference) between the two groups

COMPARISON WITHIN GROUP (Using paired sample t test)

The t value of group A (Neural mobilization with hot fomentation) was found to be greater than that of group B (TENS with hot fomentation) indicating a major difference in pre and post analysis of mean within the group. $p < 0.05$ is preferred as statistically significant and here $p < 0.001$ is considered as statistically highly significant. Hence it rejects the null hypothesis and supports the alternative hypothesis. Further the post mean of the VAS and ODI in group A are found to be much less than in group B which indicates a better recovery in range of motion and pain.

Group A	t value	Df	P
VAS (PRE AND POST)	25.015	14	<0.001
ODI (PRE AND POST)	49.868	14	<0.001

Table 3 showing comparison within group A

Group B	t value	Df	P
VAS (PRE AND POST)	12.911	14	<0.001
ODI (PRE AND POST)	15.693	14	<0.001

Table 4 showing comparison within group B

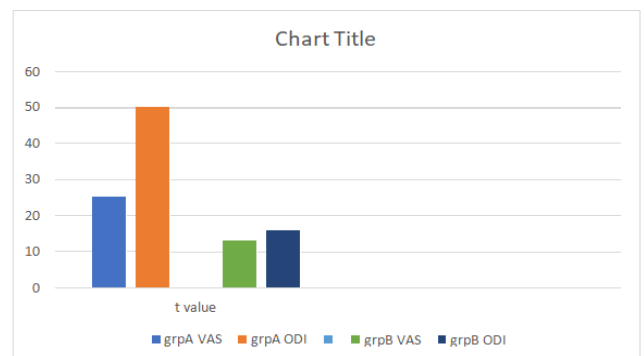


Fig. 4: showing difference of t values within the group

BETWEEN GROUPS (using paired t test)

Here, p value which is < 0.001 indicates a highly significant statistical data. t values between group B VAS (POST) and group A VAS (POST) is 7.246 and group B ODI (POST) and group A ODI (POST) is 9.435.

	t value	Df	P
Group B VAS (POST) & GROUP A VAS (POST)	7.246	14	<0.001
Group B ODI (POST) & Group A ODI (POST)	9.435	14	<0.001

Table 5 showing difference between groups



4. Discussion

According to the statistical analysis, the alternate hypothesis states that neural tissue mobilization with hot fomentation lowers pain, functional impairment, and improves pain free passive SLR, ROM in LBA participants with sciatica can be accepted, while the null hypothesis is rejected.

Treatment including Neural mobilization with hot fomentation and TENS with hot fomentation both have found to be effective in treating symptoms of sciatica i.e., reduction in pain and improving range of motion but patients who were given neural mobilization with hot fomentation there is a highly substantial improvement in pain reduction, functional impairment, and pain-free passive activity SLR range of motion even during the days patients do not take therapy and follow ergonomic advice. The reason for this improvement is the neural flossing effect which can be defined as ability to bring back normal mobility and microcirculation of nerve. It has a great importance in influencing axoplasm and lymphatic flow within the neural tissue.⁽⁶⁾

Internally, the nerve is designed with sinuous undulations. CLARK & BEARN described the nerve's ability to unfurl as its length rises. They stated that the nerve can survive elongation via intra neural gliding, which occurs between individual nerve fibers and their surrounding endoneurium, as well as the endoneurium surrounding each nerve fiber. The epineurium permits excursion between it and the perineurium of each fascicle. Extraneural gliding reduces stress between the perineurium and the epineurium. Extraneural gliding or excursion has been documented in both the central and peripheral nervous systems. Movement of the nerve root is transferred to the rootlets through the dural sheath and dentate ligaments rather than directly to the rootlets.⁽²⁾

Neural mobilization is particularly effective at breaking up adhesions and promoting mobility. It is anticipated that neurodynamic movements within pain-free ranges of motion can help reduce excessive compression, friction, and tension on neural tissues, lowering their mechanosensitivity. It is probable that the reduced mechanosensitivity is accompanied by a decrease in neural tissue ischemia or anoxia, which can lower the spontaneous firing of aberrant impulse producing neurons, reducing nociceptive input to the dorsal horns. It should be highlighted that the aforementioned

hypotheses are entirely hypothetical and will require additional scientific research before the physiological effects of neural mobilization can be determined.

The position of the patient was supine lying the hot pack was wrapped in towel with thickness of about 6-8 layers before being applied to the neck area. The hot packs were stored in hot water kept at about 72-75°C (158-167°F) inside a thermostatically controlled hot pack containers. The hot pack was initially heated for two hours and 30 minutes reheated between each use. Lahmann et al (1996) state that after 8 minutes application of hot pack the skin temperature was reached its maximum. The pack was left in place for 20, 23 & 24 minutes.

Improvement in range of motion and pain is one of the most important aims during sciatica rehabilitation so that patient is able to perform his or her activities of daily living easily and is not dependent on others. In this study there was direct comparison between neural mobilization with hot fomentation and TENS with hot fomentation. The "t" test was used to analyse the pre and post data of both the groups. In group A pre and post VAS and ODI t values showed much significance than in group B.

Mean difference of group A was found to be more relevant and higher than that of group B indicating more improvement and better result in group A. The findings were statistically significant ($p < 0.05$) in both the groups, with a high significance in group A when compared to group B.

5. Conclusion:

The mean difference in group A which is 30 and in group B which is 15.8 indicates better results in group A which is given neural mobilization with hot fomentation as a treatment protocol. The post mean in group A is found to be much less than in group B indicating better recovery in the prior group.

Further, the t values in group A is found to be more than in group B indicating more difference in pre and post treatment means as well as better result.

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