



THE EFFECT OF ACTIVE NEURAL MOBILIZATION ON H-REFLEX LATENCY IN PATIENTS WITH SUBACUTE LUMBAR RADICULOPATHY- AN INTERVENTIONAL STUDY

Physiotherapy

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ABSTRACT

Lumbar radiculopathy is a condition in which pain is caused over lower back and hip radiating to the back of the thigh and leg. In this study, 30 patients with subacute lumbar radiculopathy with age group 30-60 years were selected. All the participants received active sciatic nerve mobilization (ANM) for 6 days in 1 week along with conventional physiotherapy. The purpose was to find out the effect of active neural mobilization on H-reflex latency in patients with subacute lumbar radiculopathy. The result showed that neural mobilization in addition to conventional physiotherapy treatment is effective in reduction of H-reflex latency in patients with subacute Lumbar radiculopathy.

KEYWORDS

Lumbar Radiculopathy (LR), Active Neural Mobilization (ANM), Hoffman's Reflex (H-reflex)

INTRODUCTION

Lumbar radiculopathy is a disease in which pain is caused in the lower back and hip radiating down the back of the thigh into the leg. It is caused by damage to one of the lower spines, ranging from L1 to S1. This damage is caused by compression of the nerve roots which exit the spine. The compression can lead to tingling, radiating pain, numbness, paraesthesia and occasional shooting pains. Lumbar radiculopathy is a disorder of the spinal nerve roots from L1 to S1. [1]

Lower back pain is severely common in general population, but lumbar radiculopathy has only been reported with an incidence of 3 to 5%. 5-10% of patients with low back pain have sciatica. the annual prevalence of disc related sciatica in general population is estimated at 2.2%. The prevalence of lumbosacral radiculopathy has been situated from 9.9% to 25%. [2]

Performing late response tests, such as the H-reflex, can provide valuable information regarding the proximal nerve or nerve root involvement. The H-reflex is both a sensitive and specific marker to find out involvement of the specific nerve root and will be prolonged from the time of symptom onset. [3]

The H-reflex offers a unique ability to show the proximal integrity of the peripheral nerves. Cleland et al. showed that H-reflex can be easily evoked in the soleus, the latency of these recordings are highly reliable and provide a tool for clinicians to assess the lumbar radiculopathy. Recording of the H-reflex of the soleus muscle has proved to be an effective tool for the examination of damage of the proximal segment of the sciatic nerve. [4]

Neural tissue mobilization techniques are passive or active movements that focus on restoring the ability of the nervous system to tolerate the normal compressive, friction, and tensile forces associated with daily and sport activities. Butler has suggested that Mobilization of nervous system can be done by direct mobilization via tension test, by interfacing tissue or by postural and ergonomic advices to reduce nerve mechanosensitivity, resolve the symptoms, and restore the function. The goal of mobilization is to increase the flexibility of collagen that maintain the integrity of the nerve and movement of the nerve in relation to its surrounding structure. [5,6,7]

REVIEW OF LITERATURE

V Vijayraj et al (2018) conducted a comparative study between McKenzie technique and neural mobilization in chronic low back pain patients with radiculopathy 30 subjects with chronic low back with radiculopathy were recruited from Nandha College of Physiotherapy. The results of this study showed that along with TENS+ Traction, McKenzie Technique is significant in decreasing pain, improving functional ability and increasing spinal extension in chronic low back with radiculopathy. [8]

Subarna Das et al (2018) conducted an experimental study on Effect of

spinal mobilization with leg movement as an adjunct to neural mobilization and conventional therapy in patients with lumbar radiculopathy. 90 patients were selected randomly with lumbar radiculopathy. Duration of the study was for six weeks. The results of this study showed that SMWLM as an adjunct to neural mobilization and conventional therapy showed significantly better outcomes in pain, functional disability and SLR when compared to conventional therapy or neural mobilization and conventional therapy. [9]

Faisal Yamin et al (2016) conducted an experimental study on efficacy of sciatic nerve mobilization for the patients with lumbar radiculopathy due to prolapsed intervertebral disc. 44 patients out of which 22 were females & 22 were males ages between 25-65 years with lumbar radiculopathy due to prolapsed intervertebral disc were selected for the study. The result of this study showed that the treatment sessions of sciatic nerve mobilization/ Neurodynamic by concerning pain and restoring the mobility of nerve has been beneficial in the management of disc prolapsed patients. [10]

Jaywant Nagulkar et al (2016) conducted a comparative study between active neural mobilization during intermittent lumbar traction and intermittent lumbar traction followed by active neural mobilization in cases of lumbar radiculopathy. In this study 107 patients of LBP with radiculopathy were randomly assigned into two groups. The result of this study showed that ANM during ILT gives more relief and yields better responses in patients of LBP with radiculopathy and may help person to resume his daily activities. [11]

Dr. Mayur Solanki et al (2013) conducted a comparative study of effectiveness of mulligan mobilization versus neural mobilization in patients with cervical radiculopathy. Total 50 patients diagnosed with cervical radiculopathy. The result of this study showed that neural mobilization procedure greater comfort and better functional outcome as compared to mulligan mobilization. [12]

METHODOLOGY AND STATISTICAL ANALYSIS

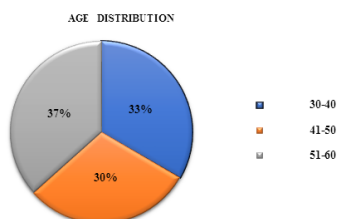
A total number of 30 patients with lumbar (L4-S1) radiculopathy diagnosed by orthopedic or neurologist were selected for the study as per the selection criteria. All the patients were asked to avoid exercise, stimulant/depressant drugs, and pain medications prior to participation in the study. H-reflex latency was measured before the treatment and after 1 weeks of treatment. After taking H-reflex latency Active neural mobilization were given to each patient. This mobilization involved positions very similar to used for sciatic nerve tests, that would place the greatest amount of tension on Sciatic nerve and produced the greatest movement in the Sciatic Nerve. The mobilization was then performed by 900 flexion of Hip joint. Hip remains 900 with both hands. Then gentle plantarflexing and dorsiflexing the Ankle joint and after that gentle flexing and extending the Knee joint. 4 sets of 10 repetitions in each set with 30 sec. rest in-between each set to emphasizing the sciatic nerve. Active Neural mobilization (ANM) given according to Butler (Self neural mobilisation). H-reflex latency

were measured before and after the intervention. Treatment was given 6 days a week for 1 weeks. The Whole statistical analysis was done by using SPSS 20.0 version for windows software. Microsoft excel was used to generate graphs and tables. Analysis of pre-H reflex latency and post 1-week H-reflex latency difference was calculated by using paired t-test.

RESULTS

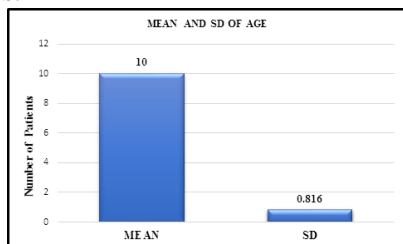
In this study, total 30 patients were included out of which in 9% were male and 21% were female. Analysis of pre and after 1week intervention H-reflex latency difference in were done by using paired t-test.

GRAPH 5.1: AGE DISTRIBUTION OF PATIENTS (YEARS):



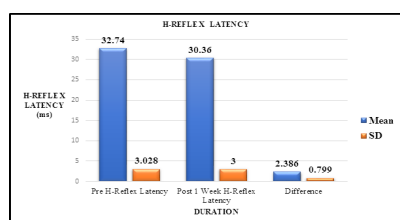
INTERPRETATION: The above table and graph shows the number of patients and percentage of age distribution in study.

GRAPH 5.2: MEAN AGE AND STANDARD DEVIATION OF PATIENTS:



ANALYSIS FOR H-REFLEX LATENCY

GRAPH 5.3: H-REFLEX LATENCY OF PRE AND POST TREATMENT GROUP



INTERPRETATION: Statistical analysis was done by using SPSS 20.0 with paired t-test for Pre and Post 1 week intervention obtained value is $t=16.352$ at <0.005 level of significance.

DISCUSSION

The results of the present study showed that the active sciatic nerve mobilization is an effective intervention to reducing H-reflex latency after the 1 week of intervention. There by these results supporting the experimental hypothesis and rejecting the null hypothesis. The results were noted significant after the 1 weeks of intervention.

This comes in agreement with Cleland et al. who mentioned that when the nerve root was compressed microcirculation was compromised and the pressure received by the nerve will affect the edema and the demyelination. Neural mobilization was sufficient to disperse the edema, thus alleviating the hypoxia and reducing the associated symptoms and increase the nerve conduction and significantly reduction in H-reflex latency after neural mobilization. [13]

According to Bove et al. possible explanation can be that strong stretch of the connective tissues due to neural mobilization around the nerve roots activates sensory fibers in the related dorsal root. So, there is a greater amount of Ia afferent inputs resulting in summation at the

spinal cord. Hence, nerve conduction would be improved leading to decrease in H-reflex latency. [14]

Obtained result for H- Reflex latency was contradictory with the results of the Dianna Dawson et al. who couldn't find out a statistically significant difference for the H-reflex latency between the two groups. The mean H-reflex latency score of patients in neural mobilization group was increased immediately after the sciatic nerve mobilization in chronic low back pain patients. The concept of neural mobilization includes links between mechanics and physiology of the nervous system in which interactions occur both way and can be capitalized therapeutically and the use of neural mobilization appear to be beneficial. [15]

CONCLUSION AND LIMITATION

The conclusion of this study is the effect of active sciatic nerve mobilization in addition to conventional physiotherapy treatment is effective in reduction of H-reflex latency in individuals with subacute lumbar radiculopathy. The limitation was room temperature could not be controlled and sample size was small so results cannot be generalized.

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