



## Effectiveness of Neural glide versus Gross Myofascial Release in patients with Mechanical Neck Pain with Upper limb Radiculopathy: A Comparative Study

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### Abstract

**Background:** Cervical radiculopathy is a clinical condition resulting from compression of cervical nerve roots. The clinical manifestation of cervical radiculopathy are broad and may include pain, sensory deficits, motor deficits, diminished reflexes, or any combination of the above. Patient with radiculopathy typically present with neck pain, arm pain corresponding to a dermatomal pattern, paraesthesia, muscle weakness in a myotomal pattern, reflex impairment/loss, headache, scapular pain, sensory and motor dysfunction in the upper extremities and neck or both.

**Aim and objectives:** The aim of the study was to find out the effect of Neural glide and Gross Myofascial release in patient with mechanical neck pain with upper limb radiculopathy.

**Methodology:** 30 patients who fulfilled inclusion criteria were randomly allocated into two groups. In Group A(n=15) subjects were treated with Tens in combination of Neural glide, whereas subjects with Group B(n=15) received Tens in combination of Gross Myofascial release technique. All interventions were conducted 5 days per week for 4 weeks. All the outcome measures were recorded by Visual analogue scale (VAS) and Neck pain and disability index (NDI) pre-treatment and 4 weeks post treatment. Total duration of this study was 4 weeks.

**Results:** Data were analysed using SPSS version 18.0. Unpaired t test was used for statistical analysis. Both the groups have shown statistically significant improvements in the outcome measures but group A has shown higher improvement in VAS(P=0.001) and NDI(P=0.004) compared to group B. **Conclusion:** This study confirmed that Neural Mobilization is more effective in decreasing pain and functional disability in patient with mechanical neck pain with upper limb radiculopathy as compared to Gross Myofascial release technique.

**Keywords:** cervical radiculopathy, Myofascial release, neural mobilization, neck pain etc.

### Introduction

Neck pain is one of the most common debilitating musculoskeletal complaints seen in physiotherapy practice. In the 2010 global burden of disease report neck pain ranked as the fourth highest disease in terms of disability. Neck pain is often associated with

headache upper back and shoulder/arm pain. In a study 65.4% of the neck pain population included in their study had arm pain associated with their neck pain<sup>1</sup>.

Clinically it is common that patients with non-specific neck pain report problem with upper limb function in which the pain spread down the arm, as far as to the fingers. Neck pain is most common in people employed in various jobs for example people who spend most of their working day at a desk with neck bend forward posture<sup>2</sup>. Cervical radiculopathy is a common clinical scenario. Patient with radiculopathy typically present with neck pain, arm pain or both<sup>3</sup>

“Cervical radiculopathy is a disease process marked by nerve compression from herniated disk material or arthritic bone spurs. This impingement typically produces neck and radiating arm pain or numbness, sensory deficits or motor dysfunction in the neck and upper extremities<sup>4</sup>. Neural mobilization involves passive movement techniques where the neural structure and anatomic structures surrounding the affected neural tissue are gently mobilized with controlled movements’ physiotherapist and other movement based therapies utilize manual assessment tests to examine and treat the contribution of neural tissue to a musculoskeletal pain such as upper quadrant neurogenic pain<sup>5</sup>. Myofascial release techniques are of two types i.e. direct and indirect. Direct myofascial release technique is applied in order to release the restrictive barrier, in this form of technique, the tissue is loaded with a constant force until release occurs. Practitioners can use knuckles, elbows or other tools to slowly stretch the restricted fascia applying a few kilograms of force. It differs from indirect method in which less pressure is applied to the affected area, and a slight twist which allows the fascia to unwind itself. The gentle form of traction causes increased blood flow and heat to the area, allowing the body natural healing mechanisms to take over. Various electrotherapeutic modalities are used in the treatment protocol of mechanical neck pain among the electrotherapeutic modalities Transcutaneous Electrical Nerve Stimulation (TENS) is considered to be simple, non-invasive analgesic technique that is used extensively in health care settings by physiotherapists<sup>5</sup>.

Recent study suggest that both the interventions techniques are effective in management of neck pain with upper limb radiculopathy, but there is lack of prior research available which compare the effectiveness of both techniques so there is a need of

a study to find out a better interventions between Neural glide and myofascial release.

## Material And Methods

Total 30 subjects were recruited from the outpatient department of Orthopaedic and department of Physiotherapy, Sharda University, Greater Noida. Inclusion criteria for this study were patient provisionally diagnosed as mechanical neck pain with cervical radiculopathy, aged between 20 to 50 years, patient showing positive compression test, manual cervical distraction test and upper limb nerve tension test and duration of pain onset 1 month. Exclusion criterion includes patients with a history of spinal surgery, tumours or malignancy around vertebral column, patient suffering from psychiatric disorders and congenital deformities. Patient with traumatic neck injury, fracture and dislocation, Cervical disc prolapse, Spinal stenosis, history of cervical trauma (whiplash disorder), Congenital torticollis, Pregnancy, Spinal infections were also excluded. Pre-participation evaluation form \*consisted of VAS, Neck disability index (NDI) which includes chief complain and history. Neck pain related disability and function need to be measured in order to assess pre and post treatment patient outcomes, as well as provide valuable information to other stakeholders<sup>6</sup>.

The Neck Disability Index (NDI) is a 10-item questionnaire that measures a patient’s self-reported neck pain related disability<sup>6</sup>

The pain VAS is a single-item scale. For pain intensity, the scale is most commonly anchored by “no pain” (score of 0) and “pain as bad as it could be” or “worst imaginable pain score of 100 [100-mm scale] . To avoid clustering of scores around a preferred numeric value, numbers or verbal descriptors at intermediate points are not recommended<sup>7</sup>.

Patients were divided randomly into two groups. Group A (15) was given Tens, Neural glide and Cervical isometric exercises. TENS was applied for duration of 20 min with a frequency ranging from 120 Hz and Cervical isometric exercises includes 10 repetitions /set, 3 sets/session 1 session/day for 4 weeks.

Group B (15) was given Tens, Gross myofascial release and Cervical isometric exercises. The

protocol for neural glide and gross myofascial release includes 10 repetitions /set, 3 sets/session 1 session/day for 4 weeks.Total intervention time was 25-30 minutes.

**Statistical analysis:-** Paired t test was used to compare the significance of difference in pre and post treatment scores within groups. Unpaired t test was used to compare the significance of difference in pre and post treatment scores between groups .Using paired t test, it was found that there is a significant differences found between Group A and Group B in both variables .(P<0.05) between pre and Post-test of subjects.

According to the results of the present research, it was concluded that on comparing the net improvement in Neck pain and disability index

(NDI)of two groups ,students t-test showed significant Group A show statistically significant greater percentage of improvement in pain and functional disability and severity of the radicular symptoms compare than Group B.

**Results**

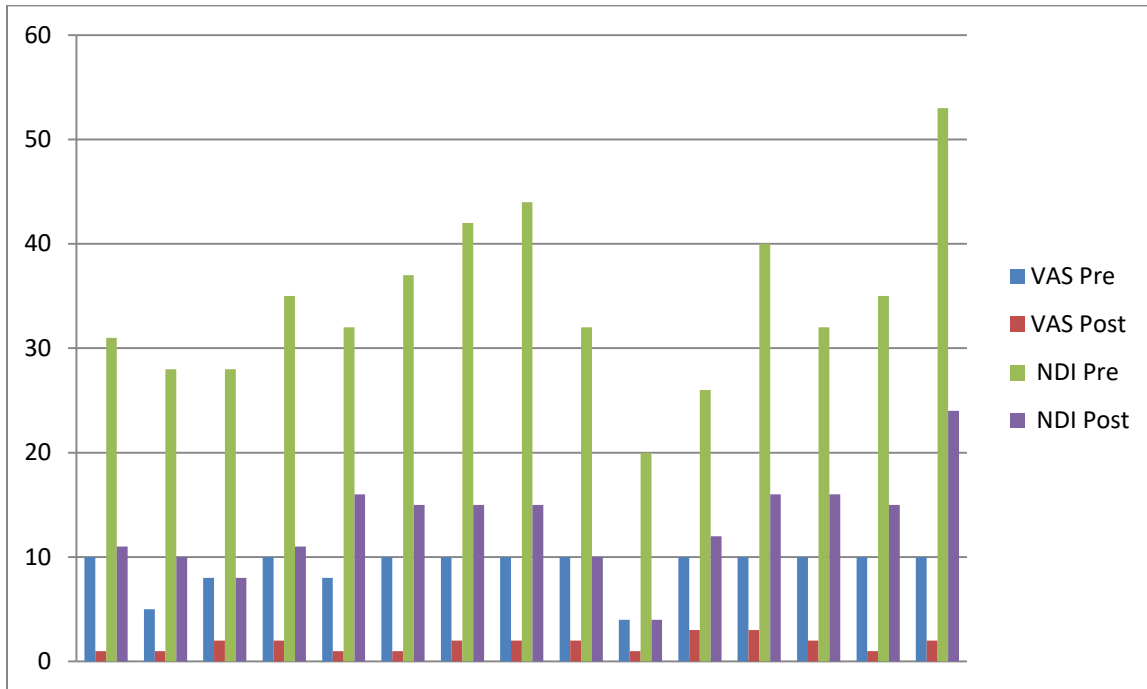
Total 30 subjects were divided randomly into Group A and Group B. The unpaired t-test was used to compare the outcomes between the groups. Data analysis was done using SPSS version 21 and Microsoft excel. Probability (P) value between 0.05 (P<0.05) & 0.01 was considered statistically significant, P <0.01 as highly significant and P >0.05 had no significance (ns). Values are reported as mean ±standard deviation (SD).

**Table 1 Show the comparison of Neural Mobilization and Gross Myofascial release technique is made on the measurement of neck disability index and visual analogue scale.**

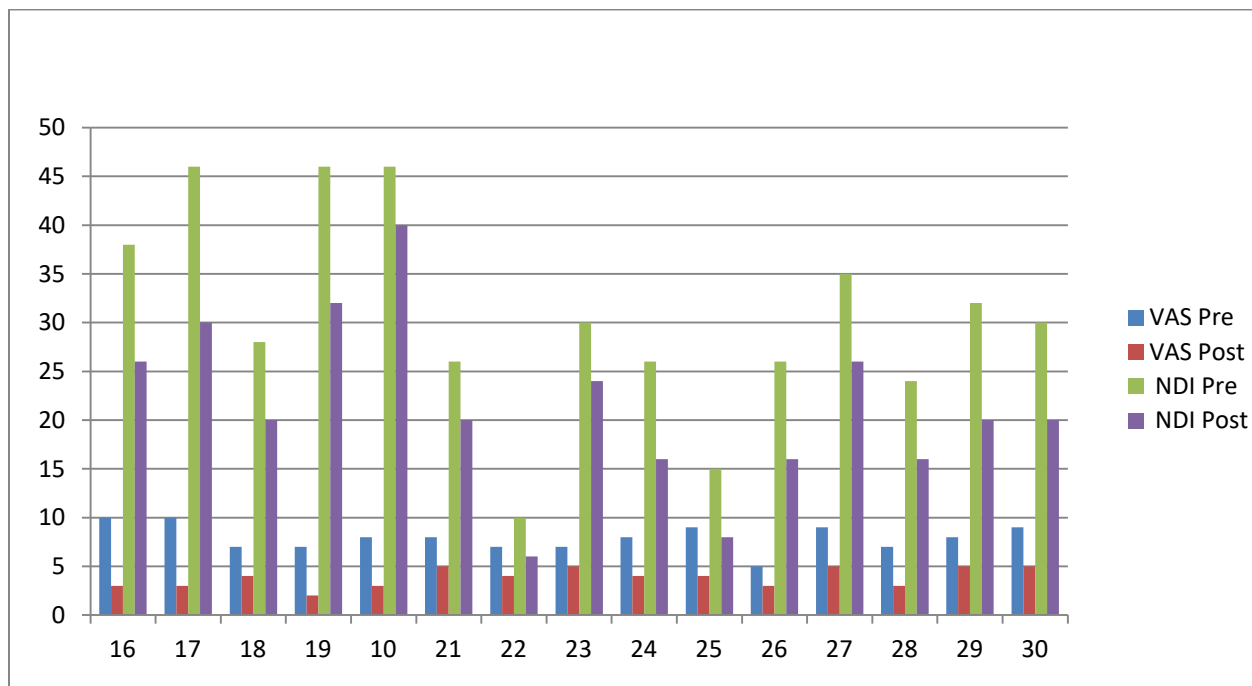
	Group A	Group B	P value
VAS PRE	9±1.96	7.93±1.33	.093 <sup>ns</sup>
VAS POST	1.73±0.70	3.86±0.99	.000 <sup>**</sup>
NDI PRE	34.33±8.12	30.53±10.58	0.279 <sup>ns</sup>
NDI POST	13.20±4.60	21.33±8.83	0.004 <sup>*</sup>

The result shows that there was no significant difference in the pre scores of the outcome variables that mean both the group were same at the baseline. Whereas statistical significant difference were recorded in the post scores of the outcome variables between the groups. Thus, the pain reduction and less disability is much higher in Group A (Neural mobilization technique). In Group B (Gross MFR technique) the treatment was also found to be beneficial in reducing pain and increasing range of motion but not as much of Group A (Table 1).

**Graph 1 show the improvement of Pre and Post of VAS and NDI score in Group A (Neural glide).**



**Graph show the improvement of Pre and Post of VAS and NDI score in Group 2 (Gross myofascial release)**



## Discussion

The purpose of this study was to compare the effect of neural glide and gross myofascial release in patient

with mechanical neck pain with upper limb radiculopathy. The overall study proved that both neural mobilisation and gross myofascial release technique is effective in improving pain and decreasing the disability level in patient with mechanical neck pain with upper limb radiculopathy but neural mobilisation groups are improved more in their outcome variables.

In MFR technique the patient were given arm pull and gross stretch of posterior cervical musculature for 5 days in a week for 4 weeks. Patient reporting improvement in muscle soreness and relieving joint stress and improve range of motion.

In neural mobilisation neural mobilisation technique used to improve altered neurodynamics and restore the dynamic balance between the relative movements of neural tissues and surrounding mechanical interfaces allowing reduce intrinsic pressure on the neural tissue promoting optimum physiological function.

It is found from the analysis that 4 weeks of intervention consisting application of TENS along with neural mobilisation and cervical isometric exercises for the patient with in group A show 55% more improvement in pain whereas 38 % more in functional disability and severity of the radicular symptoms compare than Group B who received Gross myofascial release technique with TENS and cervical isometric exercises. Group B had also given better result in mechanical neck pain with upper limb radiculopathy but not as much as group A.

In Group A patient improvement could be because of application of TENS along with neural glide and cervical isometric exercise .in this present study maintaining the application of TENS for 15 minutes and neural mobilisation to restore the normal structure and function of the nerve root that causing radiculopathy. Neural Mobilisation Techniques focuses on restoring the neural vascularity and reduce disability level and improve range of motion. It is used to normalize the cervical nerve root structure and function via the possible reduction of nerve adherence facilitation of nerve gliding and decrease neural mechanosensitivity. When the VAS and NDI were compare at pre-intervention and post-intervention between the groups was a statistically significant difference between the groups. There is significant improvement in severity of radicular

symptoms in Group a compare the Group b but group b is also show the better result but not as much of group A.

A gliding technique may reduce intraneural swelling and circulatory compromise via fluctuating effects on intraneural pressure. Nerve gliding is induced by elongation of the nerve bed which elongates the nerve, increses the nerve tension and intraneural pressure reducing the intraneural blood flow in the oedematous neuropathies [8]. Neural tissue mobilization is performed to normalize the structure and function of the nerve root through the possible facilitation of nerve gliding, reduction of intraneural swelling, pressure and inflammation, improvement of axoplasmic flow and decreased neural mechanosensitivity. neural tissue mobilization helps for restoring the normal physiological movements of the nerve with respect to the surrounding tissues as it affects the axoplasmic flow [9], movement of the nerve and its connective tissue [10] and the circulation of the nerve by alteration of the pressure in the nervous system and dispersion of intraneural oedema [11]. Neural tissue mobilization techniques focus on restoring the ability of the nervous system to tolerate the normal compressive, friction, and tensile forces associated with daily and sport activities [12,13]. Dynamically altering intraneural pressure may result in a 'pumping action' or 'milking effect' with beneficial effects on nerve hydration as it facilitates evacuation of the intraneural oedema when correctly applied and hence brings about a reduction in symptoms [14,15,16]. Thus when pain is relieved and nerve function is restored; patient slowly regains the normal physiological movements of neck and upperlimb and is able to perform his/her daily activities without pain thus improving the disability and performance of daily activities.

Thus, neural glides can be used by clinicians to treat patients with mechanical neck pain with upper limb radiculopathy for effective results.

### Conclusion

The present study concluded that Group A with Neural mobilization is more effective in decreasing pain and functional disability in patient with mechanical neck pain with upper limb radiculopathy as compared to Group B with gross myofascial release technique.

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