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To Determine the Efficacy of Neural Mobilization in Reducing Pain and Increasing Functional Ability in Patients with Cervical Radiculopathy

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ABSTRACT

Need and Purpose- *To find out the efficacy of neural mobilization in reducing pain and increasing functional ability in patients with cervical radiculopathy.*

Study Design- *random sampling*

Participant's *30 subjects recruited from different health centres and hospitals of West Bengal.*

Outcome Measures: *NPRS (Neumari pain rating scale), PSFS (patient specific functional scale)*

Result: *the effect of treatment is significant for both group A and group B by application of Pre and Post PSFS. Here t value is statistically significant with p value (.000) in group A and p value (.000) in group B. So for both the group the effects of the treatment are statistically significant.*

Conclusion: *On comparison of correlations we found that Neural Mobilization along with Neck exercise is more effective than only neck exercise assessed by using PSFS & NPRS.*

Key Words: *Cervical radiculopathy, , neural mobilization ,PSFS, NPRS.*

INTRODUCTION

Cervical Radiculopathy is a common clinical diagnosis classified as a disorder of a nerve root

and most often is the result of a compressive or inflammatory pathology from a space-occupying lesion such as a disc herniation, spondylitic spur,

or cervical osteophyte¹.The reported annual incidence of Cervical Radiculopathy is 83.2/100,000 persons, While reported prevalence is 3.5/1000 persons. Cervical radiculopathy is common in middle age with increased prevalence in 5th decade of life with male is to female ratio 2:3^{1,2}

Neural mobilization is a treatment technique used in relation to pathologies of the nervous system. It has been suggested that neural mobilization is an effective treatment technique in cervical radiculopathy patients.⁵ Neural tissue management uses specific positions and movements of the neck and arm to reduce nerve mechano sensitivity, resolve symptoms, and restore function.⁷

Cervical Radiculopathy is a common clinical diagnosis classified as a disorder of a nerve root and most often is the result of a compressive or inflammatory pathology from a space-occupying lesion such as a disc herniation, spondylitic spur, or cervical osteophyte .Patients presenting with cervical radiculopathy most frequently complain of neck pain, paresthesia and radicular pain. While sensory symptoms typically present along a dermatome, pain is often myotomal.⁴

Michael Costello, et al reported that, manipulation techniques directed to the thoracic spine, exercises, and soft tissue mobilization techniques directed to the upper quarter were associated with a dramatic improvement in physical impairments, pain, and function for a patient with cervical radiculopathy.⁶

Richard F. Ellis, et al. they concluded that neural mobilization is advocated for treatment of neurodynamic dysfunction. There majority of

studies concluded a positive therapeutic benefit from using neural mobilization.⁵

Joshua a Cleland, et al. They reported that the study design did not allow for the identification of a cause-and- effect relationship, but it appears that intermittent cervical traction, manual therapy & deep neck flexor muscle strengthening may be beneficial in the management of cervical radiculopathy.¹⁸

METHODOLOGY

SAMPLE SIZE

30 Subjects Randomly selected.

SOURCE OF DATA COLLECTION

GFC Hospital and various health centres and Hospitals, West Bengal.

STUDY DESIGN

Simple random sampling.

INCLUSION CRITERIA

To be included in the study participants must meet the following inclusion criteria:

1. Diagnosed cases of Cervical Radiculopathy.
2. Presenting with neck & upper extremity pain over a 1 months period.
3. Age group between 25-50 years.
4. Sex- Both male and females are included.
5. Patient with unilateral upper extremity symptoms.
6. Positive Spurling test.
7. Possess the ability to give informed consent, understand instruction and cooperate with treatment.

EXCLUSION CRITERIA

Participants will be excluded if they have:

1. Cervical instability patients.
2. Patients with diagnosed medical red flags (i.e. tumour, fracture, metabolic diseases, osteoporosis etc).
3. Previous neck or upper limb surgery.
4. Psychiatric illness.
5. Patients who have communication problem.
6. Refusal to co-operate.

OUTCOME MEASURES

Numeric pain rating scale (NPRS),

The Patient-Specific Functional Scale (PSFS)

PROCEDURE

The subjects are selected by simple random sampling technique. After checking the inclusion and exclusion criteria, 30 subjects were selected and assigned in to two groups.

Group A- includes 15 Subjects will be treated with Neural mobilization along with neck exercise recommended for cervical radiculopathy.

Group B- 15 Subjects will be treated with only neck exercise recommended for cervical radiculopathy.

After getting informed consent, a brief introduction about the treatment procedure to be explained to all the subjects before starting the treatment procedure.

Both groups to be evaluated for pain and disability by using the selection measurement tools.

INTERVENTION

The intervention will be given for Group A and Group B are as follows:

Group-A

Randomly selected 15 patients are assigned in to this group. All the patients before undergoing treatment will be made to go for warm up exercises.

- Neck flexion and extension exercises.
- Neck lateral bending exercises both left & right side.
- Neck rotation both left & right side.
- Shoulder elevation & depression exercises.
- Shoulder protraction & retraction exercises.

The entire warm up exercises will be performed 10 – 15 minutes and should be light & gentle. The first session will be performed on an individual basis for subjects arranged to this group and lasted for 15-20 minutes performing Strengthening exercises.

a. Deep neck flexor muscles strengthening exercises.

- The patient will be in supine lying,
- Cervical spine in neutral position,

Instruct the patient to flatten the curvature of the neck by nodding the head. Patient will be asked to hold the position for 10 seconds & repeated for 10 times.

b. Scapulothoracic exercises includes Serratus anterior and both middle and lower trapezius muscle strengthening exercises.

- The patient will stand at the wall with the arms approximately shoulder width apart. The patient performs a “Push-up with a

Plus'' exercises by pushing away from the wall until elbows are fully extended and the scapulae are protected as far as possible and perform Serratus anterior strengthening exercises¹.

- The patient will horizontally abduct the shoulder with scapular depression, adduction and upward rotation.

This will be performed at approximately 120° to 135° abduction for lower trapezius muscle re-education and at approximately 90° abduction for middle trapezius muscle re-education and perform lower & middle trapezius strengthening exercises¹. Patient's will be instructed to performed the exercises at home for 10 repetition each with an interval of 2 minutes between the exercises for 2 weeks.

Group-B

All the patients before undergoing treatment will be made to go for warm up exercises as same as Group-A subjects for 10-15 minutes. The first session will be performed on an individual basis for subjects arranged to this group and lasted for 15-20 minutes performing Strengthening exercises.

a. Deep neck flexor muscles strengthening exercises.

- The patient will be in supine lying,
- Cervical spine in neutral position,

Instructed the patient to flatten the curvature of the neck by nodding the head.

Patient will be asked to hold the position for 10 seconds & repeated for 10 times.

b. Scapulothoracic exercises includes Serratus anterior and both middle and lower trapezius muscle strengthening exercises.

- The patient should stand at the wall with the arms approximately shoulder width apart and perform Serratus anterior strengthening exercises.

DATA ANALYSIS

- Data was analyzed by using SPSS version 16.0 software.
- Data Analyzed by the help of Numeric pain rating scale (NPRS)²³ use to access the pain & The Patient-Specific Functional Scale (PSFS)²⁴ use to access the functional ability.
- In case of NPRS in this study patient rated worst pain over the last 24 hours on a 0 to 10 scale, 0 representing no pain & 10 representing the worst pain imaginable.
- The PSFS used to measure the patients perceived level of disability. The patient rates three activities that are difficult due to the patient's condition, each on a 0 to 10 scale, with 0 representing inability to perform the activity & 10 representing the ability to perform the activity as well as he or she could prior to the onset of symptoms.

RESULT

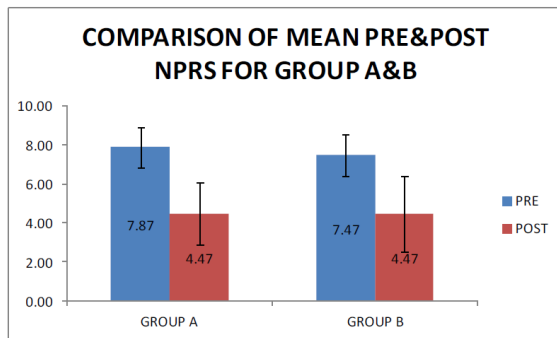


Fig 1 – Comparison of Pre and Post NPRS for Group A and B

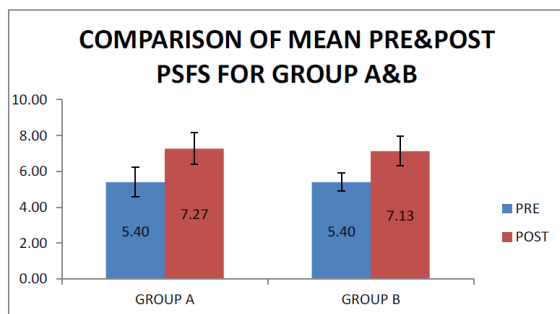


Fig-2 Comparison of Mean Pre and Post PSFS for Group A and B

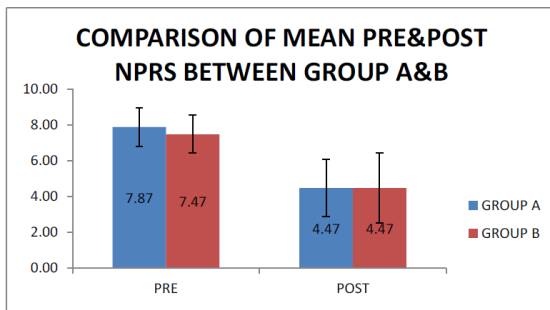


Fig- 3 Comparison of Mean Pre and Post NPRS between Group A and B

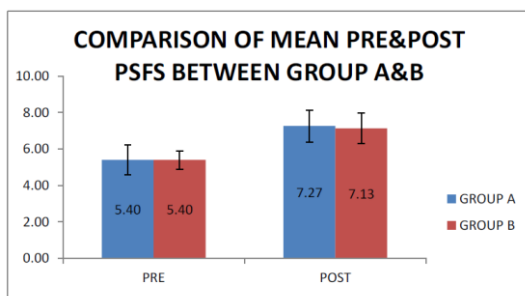


Fig- 4 Comparison of Mean Pre and Post PSFS between Group A and B

DISCUSSION

The Patient-Specific Functional Scale (PSFS) is a self-report measure, it used to measure the patients perceived level of disability. The patient rates three activities that are difficult due to the patient’s condition, each on a 0 to 10 scale, with 0 representing inability to perform the activity & 10 representing the ability to perform the activity as well as he or she could prior to the onset of symptoms. - The functional ability of each participant will be noted down according to the Patient specific Functional scale (PSFS).

In this present study, fig-1 show significant positive values of t in both group A & B. So, the effect of treatment is significant. In group A, p value is (.000) and t value (10.142), so it is statistically significant. In group B, p value is (.000) and t value is (6.029) that mean it is also statistically significant. So, both the effect of neural mobilization along with neck exercise experimented on group A and the effect of only neck exercises experimented on group B to reduce pain in patients are found significant.

In this study, fig 2 depicts that the effect of treatment is significant for both group A and group B by application of Pre and Post PSFS. Here t value is statistically significant with p value (.000) in group A and p value (.000) in group B. . So, both the effect of neural mobilization along with neck exercises experimented on group A and the effect of only neck exercises experimented on group B to increase functional ability in patients are found significant.

In this study, fig- 4 highlights the comparison of Pre & Post PSFS Scores between groups A & B.

It can be seen that, in case of group A, score increased from 5.40 to 7.27 and that of for group B is from 5.40 to 7.13. Also, statistical analysis reveals that in group A, t value (0.425) and p value is (.674). In group B t value (.000) and p value (1.00) that means it is statistically insignificant. So, it is clear that in group A patients the treatment is more effective. This

is due to the neural mobilization. So, neural mobilization along with neck exercise is found more effective for enhancing functional ability of the patients.

Lower limit of Post NPRS (-1.33702) and Upper limit of Post NPRS is (1.33702). F value is (.146) so it is insignificant and t value is (1.000) so it is also insignificant statistically. Lower limit of Pre PSFS (-.51356) and Upper limit of Pre PSFS is (.51356). F value is (.019) so it is insignificant and t value is (1.000) so it is also insignificant statistically.

Lower limit of Post PSFS (-.50927) and Upper limit of Post PSFS is (.77594). F value is(.538) so it is insignificant and t value is (.674) so it is also insignificant statistically.

LIMITATION OF THE STUDY

- This study is done only small sample size.
- Used only two self-report measures scale.
- This study done only (25-50) year's age group not focus above the age group of 50 years.
- This study was not blinded.

FUTURE RESEARCH

- Future research is needed whether Neural tissue management provides benefits in the long term.
- Future research can be done on gender basis.
- Future research should look not only at similar pathologies but also at similar neural mobilization technique that will strengthen quality of research.
- Future research is needed for occupational based cervical radiculopathy.

CONCLUSION

The present study found significant positive effect in case of Functional ability and also reduction of pain by (PSFS & NPRS) by using Neural Mobilization along with neck exercise. Also found a positive result in case where use only Neck exercise. On comparison of correlations we found that Neural Mobilization along with Neck exercise is more effective than only neck exercise assessed by using PSFS & NPRS.

Statistical analysis of all collected data showed that Neural Mobilization along with neck exercise gives more significant and effective result for reduction of pain and increase functional ability in patients' cervical radiculopathy. It can be inferred that Neural Mobilization is effective for increasing functional ability and reducing of pain in patients with cervical radiculopathy.

CLINICAL SIGNIFICANCE

The results of the present study will add on to the literature about the reduction of pain and increase

of functional ability in patients with cervical radiculopathy. It will help the physical therapist to choose a much appropriate protocol for reduction of pain and increase of functional ability in patients with cervical radiculopathy. The Neural Mobilization and neck exercise are assessed by using PSFS & NPRS.

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