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The Effects of Mulliganforearm Cervical Traction V/S Upper Limb Neural Tissue Mobilization on Neck Disability: A Randomised Control Trial

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Abstract: ***Background:Neck pain is among the most common pain problems, with a reported prevalence which is ranging from 22% to 30%.Neck pain is usually associated with headache, upper back and shoulder/arm pain. Aim and objective: To study the effects of mulligan forearm cervical traction v/s upper limb neural tissue mobilization on neck disability. Methodology: 60 participants were selected according to the inclusion and exclusion criteria and consent was taken. Participants were divided into Group A, Group B and Group C. Group A were given mulligan forearm cervical traction along with neck static exercise, Group B were given upper limb neural tissue mobilization along with neck static exercise and Group C were given only static exercise. Participants were assessed for neck disability using neck disability index and readings were noted. Assessment was done on pre and post intervention on Day 1, 7, and 14.Result:The P value of Group A is <0.0001 and Group B is <0.0001 and Group C is 0.9291.The comparative p value of all three group is 0.6796. Conclusion: In this study we concluded that, both the techniques are equally effective in managing the neck disability.***

Keywords: mulligan forearm cervical traction, upper limb neural tissue mobilization, neck disability index

1. Introduction

Neck pain is among the most common pain problems, with a reported prevalence which is ranging from 22% to 30%. It is usually accompanied by a substantial effect on the daily life of the population.[1]

Although the cervical region demonstrates the most flexibility of any of the regions of the vertebral column, stability of the cervical region, especially of the atlanto-occipital and atlantoaxial joints, is essential for support of the head and protection of the spinal cord and vertebral arteries. The cervical spine is designed for a relatively large amount of mobility.[2]

Normally, the neck moves 600 times every hour whether we are awake or sleep. The motions of flexion, extension, lateral flexion, and rotation are permitted in the cervical region. These motions are accompanied by translations that increase in magnitude from C2 to C7. However, the predominant translation occurs in the sagittal plane during flexion and extension.[2]

Neck pain and its disability have a huge impact on individuals and their families, communities, health care systems and businesses. It also has major economic consequences through the cost of health-care, work absenteeism, insurance, and pressure on health –care systems.[3]

The Bone and Joint decade task force on neck pain, classifies neck pain into four grades namely Grade 1 – no signs of major pathology and no or little interference with daily activities. Grade 2 – neck pain with no signs of major pathology, but interference with daily activities. Grade 3 – neck pain with neurologic signs of nerve compression. Grade 4 – neck pain with signs of major pathology. Neck pain is often associated with headache, upper back and shoulder/arm pain.[4]

Disability is defined as product of functioning, activity limitations and participation restriction and is influenced by contextual factors such as environment and personal factors. It considers the person as a whole, and the influence, for instance functioning, will have on the person. A study by Daffner et al. (2003) showed that 65.4% of the neck pain population included in their study had arm pain associated with their neck pain, and that the patients with neck and arm were more disabled than patients with only neck pain.[4]

In addition to pain alleviation, the increase in joint range of motion is also an intention. Changes in neurodynamics are often influenced by the surrounding tissues, called mechanical interfaces. The mechanical interface should be regarded as the most anatomically adjacent tissue to the system. Several researches have addressed the field of neurodynamic treatment. Results show promising success for symptom relief, which is assumed by improved physiology and mechanics of the neural tissues.[7]

Neural mobilization of the nervous system was described by Maitland in 1955, Elvey in 1986 and referred by Butler in 1991 is an adjunct to assessment and treatment of cervical radiculopathy. Neural mobilization is a gentle movement technique used by a physiotherapist to move the nerves is based on neurodynamic. Neurodynamic assessment techniques are incorporated into treatment involving the passive movement of the nerve relative to its environment.[5] The Mulligan techniques have been developed to overcome joint 'tracking' problems or 'positional faults', i.e. joints

with subtle biomechanical changes. Normal joints have been designed in such a way that the shape of the articular surfaces, the thickness of the cartilage, the direction of pull of muscles and tendons, facilitate free but controlled movement while simultaneously minimizing the compressive forces generated by the movement. Alteration in any of this or all the above factors would alter the joint position or tracking during movement and would provoke symptoms of pain, stiffness or weakness in the patient.[5]

2. Method

The method of this was a randomized control trial study. 60 samples were selected according to the inclusion and exclusion criteria from recognised hospitals in and around Pune. Target population was individuals with neck disability assessed with neck disability index. Random sample was the sampling method. The study included patients with age group of 35-50 years and both the gender.

Inclusion criteria

1) Both males and females.
2) Age- 35-50 years.
3) Individuals with neck disability having NDI scored from 0 to 50.

Exclusion criteria

1) Subjects who are not willing to participate in the study.
2) Intraspinal or extraspinal tumors.
3) Spinal compression.
4) Fracture of spine.
5) Fracture of upper limb.
6) Spinal deformities.

Outcome Measures

1) Neck Disability Index

Materials which were used in the study were demographic data sheet, consent form, a high plinth, notepad, universal goniometer.

In this study 78 participants were selected out of which 8 participants were excluded according to the inclusion and exclusion criteria and 10 participants were dropped out of the study. Participants were divided in three groups, Group A and Group B and Group C using random sampling.An assessor blind prospective randomized control trial was performed on these patients. Participants were assessed for neck disability using neck disability index and readings were noted. Assessment was done on pre and post intervention on Day 1, 7, and 14.

For the Group Athe subject was lying supine and the lower section of your right (or left) forearm under the patients cervical spine so that the ventral border of your radius is tucked under the base of his occiput. And two fingers of the other hand were placed under the patient chin. Then to apply the traction the hand under the occiput was pronated and translated, while delivering an equal pressure under the chin with the fingers. Along with this neck static exercise were performed in the seated position by resisting at the forehead (cervical flexion, extension, lateral flexion and rotation) for 10 second with 15 seconds break between holds with 10-15 repetitions in a progressive manner.

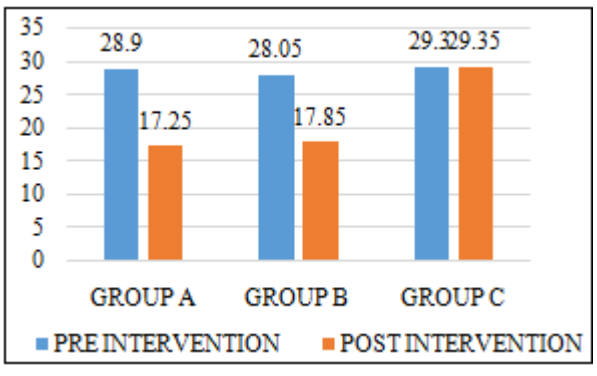
For the group B upper limb neural tissue mobilization was given by Butler technique. For anterior interosseous nerve involvement, the subject was lying supine, the maximum stretch to anterior interosseous nerve included shoulder depression and abduction, elbow extension, forearm supination, wrist extension, with contralateral side flexion. For median nerve involvement, the subject was lying supine, the maximum stretch to median nerve included shoulder girdle depression, shoulder abduction, elbow extension, shoulder external rotation, supination of the forearm, wrist finger, thumb extension and finally contralateral cervical side flexion. For radial nerve involvement, the subject was lying supine, the maximum stretch on radial nerve included shoulder girdle depression, shoulder abduction, elbow extension, shoulder medial rotation, and forearm pronation, wrist, finger and thumb flexion, wrist ulnar deviation and finally contralateral side flexion. For ulnar nerve involvement, the patient was lying supine and maximum stretch on ulnar nerve includes shoulder girdle depression, shoulder external rotation and abduction, elbow flexion, forearm supination and wrist extension and finally contralateral cervical side flexion with a hold of 15 to 20 seconds followed by release and then repeated several times according to the subject's tolerance, over 2 weeks duration thrice per week and twice per session. Along with this neck static exercise were performed in the seated position by resisting at the forehead (cervical flexion, extension, lateral flexion and rotation) for 10 second with 15 seconds break between holds with 10-15 repetitions in a progressive manner.

For the group C only neck static exercise were given in a seated position by resisting at the forehead (cervical flexion, extension, lateral flexion and rotation) for 10 second with 15 seconds break between holds with 10-15 repetitions in a progressive manner.

3. Result

Table 1: Inter Group Comparison for Neck disability index.

Outcome Measure		Group A	Group B	Group C	P Value
NDI	Pre	28.9 ± 4.229	28.05 ± 4.236	29.3 ± 4.318	
	Post	17.25 ± 2.770	17.85 ± 1.599	29.25 ± 3.498	0.6796
	P Value	<0.0001	<0.0001	0.9291	



Interpretation- Graph 1 shows that for Group A the mean neck disability index pre -treatment was 28.9 and post-treatment was 17.25 with a p value of <0.0001. For Group B

the mean neck disability index pre -treatment was 28.05 and post-treatment was 17.85 with a p value of <0.0001. For Group C the mean neck disability index pre -treatment was 29.3 and post-treatment was 29.35 with a p value of 0.9291. The comparative p value of all three groups is 0.6796.

4. Discussion

The purpose of this study was to compare the effects of the mulligan forearm cervical traction v/s upper limb neural tissue mobilization on neck disability. Neck pain is among the most common pain problems, with a reported prevalence which is ranging from 22% to 30%. It is usually accompanied by a substantial effect on the daily life of the population.

In this study, 78 participants were selected out of which 8 participants were excluded according to the inclusion and exclusion criteria and 10 participants were dropped out of the study. The participants included were in the age of 35-50 years. Both male and female were included. Aims and objectives were discussed with the participants and consent was taken.

The pre and post intervention results of Neck disability index were extremely significant with P value <0.0001 for both mulligan forearm traction and upper limb neural mobilization. The pre and post intervention results of Group C was not significant with P value 0.9291.

According to Jason m. Beneciuk et al reported that Neurodynamics is an intervention aimed at restoring the homeostasis in and around the nervous system, by mobilization of the nervous system itself or the structures that surround the nervous system. Neural mobilization facilitates movement between neural structures and their surroundings (interface) through manual techniques or exercise.[13]

Brian R. Mulligan which showed that the effect of the mulligan cervical traction is due to distraction of the upper cervical joints while the natural lordosis is maintained due to the positioning of the forearm.[5]
According to Mamoona Anwar (2016) et al underwent the study of effectiveness of neurodynamics in comparison to manual traction in the management of cervical radiculopathy. She concluded that the treatment techniques, neurodynamics and manual traction were effective in alleviating the symptoms associated with cervical radiculopathy in terms of decreasing pain intensity, increasing ranges of motion and improving functional capacity.

According to Yesim Dusunceli (2009) et al underwent the study of efficacy of neck stabilization exercises for neck pain. He concluded that this study shows that a combination treatment of NSE + PTA is the more effective intervention for the management of neck pain, with some advantages in the outcomes for pain and disability over the combination of ISE+ PTA, or PTA alone.

5. Conclusion

In this study we concluded that, both the techniques are equally effective in reducing the neck disability.

6. Future Scope

1) Study can be done in large population.
2) Study can be done in different professionals like auto-rikshaw drivers, dentists.
3) Study Can be done for longer duration.

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