



EFFECTS OF MEDIAN NERVE NEURODYNAMIC SNAG ON PAIN, DISABILITY AND ULTT 1 ELBOW EXTENSION RANGE OF MOTION AMONG PATIENTS WITH UNILATERAL C6 RADICULOPATHY.

Physiotherapy

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ABSTRACT

BACKGROUND AND OBJECTIVES: Cervical radiculopathy is marked by cervical nerve root compression and inflammation at or near the cervical neural foramen. The purpose of this research was to study the combined effects of Neurodynamic SNAG along with conventional physiotherapy for cervical radiculopathy.

MATERIALS AND METHODS: Total 18 patients with unilateral C6 cervical radiculopathy were randomly allocated into 2 groups. Group A (n=9) received median nerve neurodynamic SNAG along with conventional therapy whereas Group B (n=9) received conventional therapy alone. One session per day, for 7 consecutive days. Post test measured on seventh day after treatment.

RESULTS: Statistically, Group A showed significant improvement in reducing pain, disability and improving ULTT 1 elbow extension range of motion.

CONCLUSION: Addition of Neurodynamic SNAG with conventional physiotherapy is effective intervention in cervical radiculopathy patients.

KEYWORDS

Neurodynamic SNAG, Upper Limb Tension Test 1 (ULTT 1), Neck Disability Index (NDI), Numerical Pain Rating Scale (NPRS)

INTRODUCTION:

Cervical radiculopathy is a subgroup of neck disorders affecting cervical nerve roots. Epidemiological data showed the annual incidence to be 83 per 100,000 persons with 0.1% in males and 0.06% in females with increased incidence occurring in the fourth and fifth decade of life [1,2]. C6 and C7 nerve roots are most frequently involved with C6 nerve root involvement accounting for 36.1%. Patients with C5-C6 disc prolapse commonly present with symptoms in median nerve distribution as it has major autonomic supply from C5 and C6 nerve roots. Symptoms associated with C6 radiculopathy are pain or numbness radiating from the neck to the lateral aspect of the biceps, lateral aspect of the forearm, the dorsum of the hand at the web space between the thumb and index finger and into the tips. A clinical predictive value for diagnosis of cervical radiculopathy proposed by wainner et al includes 1) cervical distraction test 2) upper limb tension test 3) spurling test 4) ipsilateral cervical rotation ROM reduced by more than 60° [3,4]. If all four test comes positive the likelihood ratio of having cervical radiculopathy is 10. If 3 of these 4 tests are positive the likelihood ratio decreases to 6. According to Straus et al, likelihood ratio of greater than 10 is large and likelihood ratio between 5 and 10 is moderate.

Neural mobilization improve the gliding movement of nerve root and reduce the increased mechanosensitivity as well as the pathophysiological changes associated with nerve compression. SNAG introduced by Mulligan are movement with mobilization techniques with immediate effects to restore pain free unrestricted movements.

Collectively, literature on the effects of combined neurodynamic SNAG in reducing pain and disability seems to be limited. Hence this study is an attempt to see the effects of median nerve neurodynamic SNAG along with conventional physiotherapy on pain, disability and elbow extension range of motion among unilateral C6 radiculopathy patients.

METHODS

An experimental study design was conducted with 18 patients who satisfied the inclusion criterias: 40-60 yrs, all genders, presence of non traumatic neck and unilateral arm pain, average level of pain >3/10 in NPRS, pain along median nerve distribution, Atleast one neurological sign of an lower motor neuron lesion to upper limb, positive response to atleast 3 of the following clinical test :spurling ,ULTT1, cervical distraction test and less than 60 cervical rotation on impaired side.

Subjects were excluded if they have a history of cervical spondylosis, myelopathy, vertebral artery insufficiency ,neurological disorders, medical red flags : tumor, fracture, metabolic disease, RA, involvement of more than 2 nerve roots, bilateral involvement ,signs of UMN, surgery to cervical spine /upper limb within last 6 months.A

written consent form was obtained from the selected patients.

OUTCOME MEASURES-

NDI, NPRS and elbow extension range during ULTT 1. Patient was made to lie supine. The affected limb was taken into 110 degree shoulder abduction, forearm supination, wrist and finger extension, and external rotation of shoulder joint ,and finally elbow moved into extension till patient reports submaximal pain. The elbow extension ROM is noted with help of universal goniometer.

Participants were then randomly allocated into GROUP A (experimental group ,N=9) and GROUP B (control group ,N=9) by the alternate number method.

GroupA received Median nerve Neurodynamic SNAG with conventional therapy whereas GroupB received conventional therapy for 1 week. Posttest measures were taken at the end of treatment on the 7th day on NDI, NPRS and elbow extension range of motion in ULTT 1.

INTERVENTION

NEURODYNAMIC SNAG:

This was a two therapist technique. Patient sat upright on a chair. Therapist took the affected limb into 110 degree shoulder abduction, forearm supination, wrist and finger extension, and external rotation of shoulder joint and finally elbow moved into extension till patient reports submaximal pain. From this position elbow is slightly flexed to approximately 5° where pain disappeared. This position was held by the assistant therapist. Therapist delivering SNAG, stands behind the patient and places medial border of the right thumb at the articular pillar of C5/C6 where C5 facet was glided supero-anteriorly towards the eyeball over the C6 .Patient was encouraged to flex his /her neck and slight overpressure was given with normal hand by the patient and simultaneously assistant therapist mobilize by extending his /her elbow while the SNAG is sustained. Total of 3 sets were given with a break of one minute between each sets.

Conventional Physiotherapy:

Intermittent Cervical Traction

Supine lying with cervical spine in slightly flexed position. Parameters- Treatment duration 20 minutes, 7% of the body weight with 60 seconds hold time and 20 seconds rest time.

Strengthening Exercises

Neck isometrics, Deep neck flexor and scapulothoracic strengthening exercises.

Both the groups were educated about good posture during sitting, working and standing.

RESULTS

Intragroup comparison

The paired t tests was done between pre-test and post-test within the groups as shown in Table 1. Since the calculated 't' value was greater than the table 't' value there was significant reduction in disability, pain and improvement in elbow extension range of motion in both groups.

Intergroup comparison

Pre-test using independent t test showed no significant differences between the groups with calculated t value less than the table t value as shown in Table 2 for any of the outcome measures to maintain the homogeneity between the groups.

Post-test using independent t test showed significant difference between the outcome measures with the calculated t value greater than table t value as shown in Table 2.

DISCUSSION

Immediate improvements in pain, range of motion and functional abilities are seen in techniques combining SNAG with neurodynamic mobilization^[5]

A Minimal Detectable Change (MDC) of 5 points is required to justify with 90 % certainty that a real change has occurred in individuals post intervention.^[6,7]

Disability-Both groups met the requirement of a real change with group A having a greater difference of 10 points in mean values than group B with a difference of only 5 points as show in graph 1. This in turn proved that the normal gliding movements of the nerve and altered biomechanics were not restored significantly in group B.

Pain-Patients from both the groups showed reduction in pain with group B demonstrating a difference of 2 points and group A with 3 points difference between the means of pretest and posttest of day 7 in NPRS as shown in graph 1. This shows that the improvement in group A was much better which explains the analgesic effects of neural mobilization by facilitating nerve gliding, improvement of axoplasmic flow and decreased neural sensitivity^[8].

There was a significant improvement in UTT1 elbow extension range of motion in group A with 26 degrees difference compared to group B with a difference of 6 degrees only as shown in graph 1.

From the results of this 1 week treatment study, it is recommended that median nerve neurodynamic SNAG along with intermittent cervical traction and strengthening exercises can be used as a treatment strategy in the management of patients with cervical radiculopathy with considerable pain, disability and reduced elbow extension range in ULTT1.

We suggest a follow up study which can be done to analyze the sustenance of the effects also with a greater sample size. Long term follow up can be considered in future studies. Exact locations of nerve root compression which can be analyzed through MRI studies were not possible due to lack of funding. Patients with multiple level nerve root involvement as well as other nerve root involvement can be studied. More advanced device such as electronic goniometer, etc. can be used for more quantitative data analysis.

CONCLUSION

The result indicates while treating a patient with cervical radiculopathy with pain, disability and reduced elbow extension range Median nerve neurodynamic SNAG along with intermittent cervical traction and strengthening exercises can be incorporated.

Table 1 - Paired 't' test values

OUTCOME MEASURES		MEAN VALUES		CALCULATED 't' VALUE	TABLE 't' VALUE	LEVEL OF SIGNIFICANCE
		PRE TEST	POST TEST			
NDI	Group A	20	10	9.80	2.306	p<0.05 significant
	Group B	19	14	4.45	2.306	p<0.05 significant
NPRS	Group A	5	2	12.85	2.306	p<0.05 significant
	Group B	6	4	3.54	2.306	p<0.05 significant

ULTT1 elbow extension ROM	Group A	40	66	10.64	2.306	p<0.05 significant
	Group B	48	54	5.07	2.306	p<0.05 significant

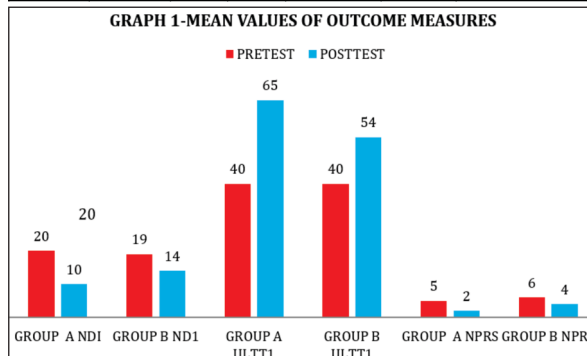


Table 2 - INDEPENDENT 't' TEST

OUTCOME MEASURES		MEAN VALUE		CALCULATED 't' VALUE	TABLE 't' VALUE	LEVEL OF SIGNIFICANCE
		GROUP A	GROUP B			
Neck Disability index	Pre test	20	19	0.702	2.120	p>0.05 not significant
	Post test	10	14	3.625	2.120	p<0.05 significant
NPRS	Pre test	5	6	1.60	2.120	p>0.05 not significant
	Post test	2	4	3.56	2.120	p<0.05 significant
ULTT1 elbow extension ROM	Pre test	40	48	1.462	2.120	p>0.05 not significant
	Post test	66	54	2.60	2.120	p<0.05 significant

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