ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

EFFECTS OF CERVICAL MUSCLE ENDURANCE TRAINING ON CERVICAL FLEXOR AND EXTENSORS IN MECHANICAL NECK PAIN

SRILATHA K* AND KOTTEESWARAN K

Saveetha College of Physiotherapy, Saveetha University, Thandalam, Chennai, India

***Corresponding Author: E Mail: dr.srilathaphysio@gmail.com; Mob.: +91 8056032340**

ABSTRACT

Study was performed with an aim to analyze the effects of Cervical Muscle Endurance Exercises in Mechanical Neck Pain. To evaluate the effect of cervical muscle endurance exercises in relieving neck pain. To evaluate the effect of Cervical muscle endurance exercises in improving Cervical flexors & extensors. To evaluate the effect of Cervical muscle endurance exercise in improving activities of daily living. 30 Subjects with mechanical neck pain were selected based on the inclusion and exclusion criteria. The subjects were divided into 2 groups namely Group-A & Group- B with 15 subjects in each group. Group-A subjects received interferential therapy, Group-B subjects received interferential therapy and endurance Exercise. All the values were tabulated and statistically analyzed by using paired and unpaired t-test. Paired t-test is used to compare data set within the groups and unpaired t-test is used to compare the data set between the groups.Student t test analysis revealed significant difference ($p<0.0001$) between the two groups in the parameter of cervical endurance test, neck disability index scale. Interferential therapy and endurance exercise's given in this study was found to be increasing endurance and decreasing disability**.**

Keywords: Neck Pain, Endurance exercise, Cervical Endurance Test

INTRODUCTION

Neck pain is a common in the general population, with 70% of individuals affected some time in their lives **[1]**. Then 5% to 10% of adults having a disabling neck pain problem **[1, 2]**, about two-third of the population suffers neck pain at some stages throughout their life. Pain in the neck can be due to mechanical or muscular problems. Neck pain is seen more in women than men. McKenZie **[3]** and Haughie *et al*., 1995, **[4],** have proposed that nonspecific neck pain results from poor posture , arising through the sustained , long –term , abnormal physiological loads that such posture improves the neck, **[4, 5]** with a consequent reduction in neck posture, and neck muscle endurance have not been firmly established. There is conflicting evidence for the proposed causative relationship between neck pain and neck muscle strength **[6]**. **[6]** failed to show an association between deep short flexor endurance of the neck and neck pain in their population–based study, but Grant *et al*., **[7]**, using a different measurement protocol, reported an association. A test of neck muscle endurance is needed to determine whether effect of cervical muscle endurance for neck pain. A systematic review of the literature has indicated that the 1-year prevalence of neck pain ranges between 16.7% and 75.1% (mean, 37.2%). Additionally, mechanical neck pain results in substantial disability and costs **[8-10]**. Exercises are commonly used to improve neck muscle function and thereby decrease pain or other symptoms muscle strength assessment is frequently used in clinical trials to evaluate treatment progress, and furthermore, muscle strength exercises are used as treatment for neck pain **[11-13]**. Active neck muscle training may be useful in building up endurance and there by relieves mechanical neck pain and disability caused by repetitive strain.

MATERIALS AND METHODS

Among the selected population, based on inclusion and exclusion criteria the mechanical neck pain subjects are included for this study. After inclusion of the all subjects cervical flexor and extensor muscle endurance is tested those who are selected endurance level they are selected for this study. Detailed procedure and effects explained in patients' word and those who in trusted, informed consent was obtained. Before starting the procedure the subject's pain & disability was assessed with NDI in percentage (%) and cervical flexor extensor muscle endurance test (sec) is used for asses' endurance level. In this fifteen subjects are selected for the control group and other fifteen are selected for the experimental group**.** Control group received Interferential therapy (IFT) for 7dayswith 0the Duration of 10 minute and Frequency of 100-120Hz, Intensity of mild sensory feeling in the Quadripolar method Experimental group received interferential therapy same as control group with endurance exercises for cervical flexors and extensors muscles for 3 days in a week for 4 weeks.

The endurance training group will be performing 15 sec hold for 20 repetitions like 3 sets given in supine & prone head lifts interval period of 3 minutes in each set giving in deep cervical flexors muscles & extensor muscles. Isometric neutral flexion be performed subjects position in supine lying asked to chin tuck without lifting the head for 15 seconds repeated for 20 times like 3 Sets for 4 weeks Duration. Isometric neutral neck extension be performed Subject position in prone lying asked to chin tuck without lifting the head for 15 seconds repeated for 20 repetitions like 3 sets for 4 weeks Duration. The raband exercises for neck patient positioned in prone lying and extend the neck and head backwards. The raband will be placed on the fore head and subject will be asked to reverse back to the starting position Exercise will be performed 15 sec hold for 20 repetitions like 3 sets for 4 weeks Duration. The raband exercises for neck Patient positioned in supine lying and flex the neck and head forwards the raband will be placed occipital region and stretched subject will be ask to return to starting position Exercise will be performed 15 sec hold for 20repetitions like 3 sets for 4 weeks duration. The Neck pain disability Index scale will be used to measure disability and Cervical muscle endurance test (seconds) to measure the neck muscle endurance.

RESULTS

Data Analysis

Paired t-test was used to analysis the significant difference with in groups**.** To analyze the significant difference between the group student't' test was performed.

From statistical analysis made with the quantitative data revealed statistically significant difference between the Group A & Group B, and also within the group. The post test mean value of cervical endurance test in Group A is 1.85 and in group B is 2.56 this shows that cervical endurance test in group B were comparatively more than group A, $P<0.0001$. The Post Test mean value of neck Disability Index Questionnaire (NDI) in group A is 7.87%and in group B is 5.13 %This shows that neck disability index in Group B were comparatively more than Group A, $P<0.0001$.Statistical Analysis of post test, cervical endurance test and Neck Disability Index revealed that there is high statically significant difference seen between group A and group B and their better improvement seen in Group B.

Table 1: Pre and Post Values of Group A

Group A		Mean		Standard Deviation	T value	P value
Neck disability index scale (%)	Pre test	16.07		2.74	12.93	0.0001
	Post test	7.87		2.00		
Cervical endurance test (seconds)	Pre test	flexor	1.29	0.10	6.48	0.0001
		extensor	1.30	0.09		
	Post test	flexor	1.85	0.39	12.83	0.0001
		extensor	2.56	0.40		

Table 2: Pre and Post Test Values of Group B

Group A		Mean		Standard Deviation	T value	P value
Neck disability index scale (%)	Pre test	15.87		3.66	13.01	0.0001
	Post test	5.13		1.73		
Cervical endurance test (seconds)	Pre test	Flexor	1.29	0.10	12.83	0.0001
		extensor	1.30	0.09		
	Post test	Flexor	2.56	0.40	12.09	0.0001
		Extensor	2.51	0.38		

Table 3: Comparison of Group A and Group B

Para Meter	Group A			Group B		't' test	Significance
	Mean		Standard deviation	Mean	Standard deviation		
Neck disability index scale (%)	7.87		2.00	5.13	1.73	4.01	0.0001
Cervical en durance test (seconds)	Cervical flexors	1.85	0.39	2.58	0.41	4.86	0.0001
	Cervical extensors	1.83	0.30	2.51	0.38	5.25	0.0001

DISCUSSION

In this study subjects with mechanical neck pain were taken. Cervical muscle endurance was assessed using two endurance test which are Cervical flexor endurance test was used to assess the flexor endurance and cervical extensor endurance test was used to assess the extensor endurance. At the end of the fourth week endurance exercise and the raband exercise which was given to increase muscle endurance showed improvement in the neck flexors and extensors muscle endurance. With improvement in the muscle endurance, endurance exercise and the raband exercise showed gradual decrease in the disability

Some studies also support the effect of cervical endurance and the raband that strength and endurance training is effective in decreasing disability. **[14]** suggested in his study that there was gain in the cervical muscle strength after the endurance exercise more over the feedback from the endurance test results and improved function and presumably encouraged subject to continue training.

[15], compared the effect of single set of dynamic exercise and dynamic and isometric exercise performed with a cervical extension machine. After eight weeks peak isometric neck strength had increased by thirty five to forty percent.

Grimmer described a test that timed the pain free subjects ability to maintain chin tuck when the supine position while holding the back of the head 2 cm above the plinth **[16]**. The general the literature indicates that individuals with neck pain demonstrate a reduced to maintain a chin tuck position while surface electromyography recordings of the superficial neck flexors increased in the amplitude.

Upper cervical flexion, described in four articles, is measured with an inflatable pressure sphygmomanometer unit placed behind the neck, with the patient in a supine position. Endurance tests for the neck flexors was the most frequently evaluated test. They had an acceptable reliability. The best test for the muscle endurance of the neck flexors seems to be one in which the patient ask to press the cuff in supine lying , while the chin tuck is monitored by the musculoskeletal practitioner.

Endurance tests for the neck extensors was the most frequently evaluated test. They had an acceptable reliability. The best test for the muscle endurance of the neck extensors seems to be one in which the patient raises their head in prone lying , while the chin tuck is monitored by the musculoskeletal practitioner.

So this study shows endurance type of exercises may helpful to increases the neck muscle, and in turn reduces the musculoskeletal neck pain. During the study the participants are trained to do the endurance exercise in this sum of the individuals are very well performed the exercises, so, better results obtained. Some of the patients felt difficulty initial time of exercises, but they were rest and after a period over all the subjects participated in this study performed well, cooperative so, we are obtaining better results related to this study. Active neck muscle training intervention should be extended for long duration. These are all recommendation for this study only a few months of training have been shown to produce only temporary improvements in various outcome measures thus, intensive training recommended for longer duration to treat pain and disability.

CONCLUSION

This study concluded that combined effect of neck endurance exercises and interferential therapy Group B shows more effective in treating the mechanical neck pain subjects, then the Group A who receive the interferential therapy in increasing endurance and decreasing disability also clinically it is better to treat mechanical neck pain in general with endurance exercise and interferential therapy.

ACKNOWLEDGEMENT

It's a pleasure to acknowledge the dept I owe to many people who had an influence on me & helped me developed my foundation in this study work. My sincere thanks to all my staff and clinical in charge helped me throughout the study

REFERENCES

[1] Cote P, *et al*., The Saskatchewan Health and Back Pain Survey the prevalence of neck pain and related disability in Saskatchewan adults, Spine, 23, 1998, 1689-98.

[2] Bovim G, *et al*., Neck pain in the general population, Spine, 19, 1994, 1307-9.

[3] McKenzie R, The cervical and thoracic spine: mechanical diagnosis and therapy, Waikanae, NZ7 Spinal Publications;

[4] Haughie LJ, *et al*., Relationship of forward head posture and cervical backward bending to neck pain, J. Manual Manipulative Ther., 3, 1995, 91 -7.

[5] Braun BL, *et al*., Quantitative assessment of head and shoulder posture, Arch. Phys. Med. Rehabil., 70, 1989, 322-9.

[6] Griegel-Morris P, *et al*., Incidence of common postural abnormalities in the cervical, shoulder, and thoracic regions and their association with pain in two age groups of healthy subjects, Phys. Ther., 72, 1992, 425- 31.

[7] Janda V, Muscles and motor control in cervicogenic disorders: assessment and management. In: Grant R, editor. Physical therapy of the cervical and thoracic spine, 2nd Ed., New York, NY7 Churchill Livingstone, 1994, 195-216.

[8] Grant R, *et al*., Screen based keyboard operation: the adverse effects on the neural system, Aust. J. Physiotherapy, 41, 1995, 99- 107.

[9] Fejer R, *et al*., The prevalence of neck pain in the world population: a systematic critical review of the literature, Eur. Spine. J., 15, 2006, 834-848, http://dx.doi.org/10.1007.

[10] Borghouts JA *et al*., 1996 -of-illness of neck pain in the Netherlands, Pain, 80, 1999, 629-636.

[11] Cote P, *et al*., The factors associated with neck pain and its related disability in the Saskatchewan population, Spine (Phila Pa1976), 25, 2000, 1109-1117.

[12] Korthals-de Bos IB, *et al.*, Cost electiveness of physiotherapy ,manual therapy, and general practitioner care for neck pain: economic evaluation alongside randomized controlled trial, BMJ., 326, 2003, 911.http://dx.doi.org/10.1136/bmj.326.7395.911

[13] Barton PM and Hayes KC, Neck flexor muscle strength, efficiency, and relaxation times in normal subjects and subjects with unilateral neck pain and headache, Arch. Phys. Med. Rehabil., 77, 2003, 680-687, doi: 10.1016/S0003-9993(96)90008-8.

[14] Lee H, *et al.*, Neck muscle endurance, self-report, and range of motion data from subjects with treated and untreated neck pain, J. Manipulative Physiol. Ther., 28, 2005, 25-32, doi: 10.1016/j.jmpt.2004.12.005.

[15] Sjoggard G, *et al.*, the role of muscle activity and mental load in the development of pain and degenerative process of the muscle cell level during computer work, Eur. J. Applied Physiol., 83, 2000, 99-105.

[16] Manuel SH, *et al*, Short-Term Effects of Kinesio Taping Versus Cervical Thrust Manipulation in Patients with Mechanical Neck Pain: A Randomized Clinical Trial.