ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 12, Issue, 07, pp.12168-12171, July, 2020

DOI: https://doi.org/10.24941/ijcr.39094.07.2020

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EFFECTIVENESS OF NEURAL MOBILIZATION AND POSTURAL CORRECTION ON PAIN AND CRANIO-VERTEBRAL ANGLE IN CERVICOGENIC HEADACHE – A COMPARATIVE STUDY

Jayabalan Prakash[1,*], Marisamy Sindhu[2] and Tittu Thomas James[3*]

[1]Professor, KMCH College of Physiotherapy, Coimbatore, Tamil Nadu, India
[2]Physiotherapy Intern, KMCH College of Physiotherapy, Coimbatore, Tamil Nadu, India
[3]Physiotherapist, National Institute of Mental Health and Neuro Sciences, NIMHANS, Bengaluru, Karnataka, India

ARTICLE INFO

Article History:
Received 20th April, 2020
Received in revised form
29th May, 2020
Accepted 27th June, 2020
Published online 25th July, 2020

Key Words:
Cervicogenic Headache,
Neural Mobilization,
Craniovertebral Angle.

ABSTRACT

Background: Cervicogenic headache is a syndrome characterized by chronic hemi-cranial pain thatis referred to head from either bony structure or soft tissue of the neck. Adverse neyrodymanics as well as altered biomechanics of the cervical spine contribute to this. **Objective:** This study identifies the effect of neural mobilization and postural correction exercises on reducing pain and improving cranio-vertebral angle in patients with cervicogenic headache. **Methods:** 30 patients who were diagnosed with cervicogenic headache were divided in to two equal groups. Group A received neural mobilization and postural correction exercises whereas the other group (B) received postural correction exercises alone. Analysis was performed using t test between the pre and post-test values. **Results:** It was found that both group demonstrated significant improvement ($p<0.05$). On analysing mean difference, it was identified that group A showed more improvement than group B in terms of HIT-6 (-8.66 vs. -1.7) and improvements in cranio-vertebral angle (5.82 vs. 3.6). **Conclusion:** We conclude that administering neural mobilization and postural correction together will provide better results in the treatment of cervicogenic headache.

Citation: ***Jayabalan Prakash, Marisamy Sindhu and Tittu Thomas James*, 2020.** "Effectiveness of neural mobilization and postural correction on pain and cranio-vertebral angle in cervicogenic headache – a comparative study". *International Journal of Current Research*, 12, (07), 12168-12171.

INTRODUCTION

Headache is the pain felt anywhere in the region of head or neck. It is one of the most common problem come across medical practice. Headache which are believed to originate from structures in the neck have been given various name, ranging from broad terms such as cervical, occipital, and cervicogenic, to specific terms such as third nerve occipital headache. Cervicogenic headache is a syndrome characterized by chronic hemi-cranial pain that is referred to head from either bony structure or soft tissue of the neck (Headache classification committee of the international headache society, 2018). The prevalence of cervicogenic headache in general population is estimated from 0.4 to 2.5%. But is as high as20% in patients with chronic headache, with a mean age of 42.9years. Cervicogenic headache is found to be four times more prevalent in women than in men **(**Biondi, 2005**).** In 1983, Sjaasted and colleagues first characterized the features of headache type that they felt was very likely originate in cervical spine and applied the term cervicogenicheadache.

Corresponding author: **Jayabalan Prakash,**
Professor, KMCH College of Physiotherapy, Coimbatore, Tamil Nadu, India.

He documented a diagnostic criterion for cervicogenic headache in 1990 and revised it in 1998.3The pathophysiological mechanism of this type of disorder arises primarily from musculoskeletal dysfunction in the upper segments of cervical spine.The convergence of cervical nerves and the afferents from the trigeminal nucleus issaid to be the neuro–physiological basis for cervicogenic headache. Therefore the actual source of pain originates in the cervical spine complex. Structures innervated by cervical nerves C1-C3could be the possible sources of pain **(**Al Khalil, 2020**).** Physical therapists are involved in the management of cervicogenicheadache. Studies have showed the articular and muscular dysfunctions in cervicogenic headache and demonstrated the effectiveness of their treatment but little focus has been given to the neurogenic disorder. Neural mobilization, includes the interactions between mechanics and physiology of the neurons system. The nervous system must adapt during the wide range and combination of movements. The neural elements should undergo mechanical events like, elongation compression, sliding, cross- sectional changes and angulation along with physiological events like intra- neural blood flow and axoplasm flow for a normal neural mobilization (Hunt, 2002).

Table 1. Exercise protocol of the study

Treatment	Procedure	Description
Neural Mobilization	Neural sliders	Bilateral straight leg (one- ended slider) whilst the neck is positioned in the most comfortable position for the patient.
	Tensioners	Upper cervical flexion and contralateral lateral flexion were performed along with bilateral lower limb straight leg raise.
Postural Correction	Training the holding capacity of deep neck flexors	This was done by using air filled sensor initially by placing it at the level of cranio-cervical junction in supine lying. • Training was initiated at lowest levels of test (20 or 22 mmHg) • Patient attempts to node their head to reach the desired value of feedback. • Hold steadily this position for 10 seconds without obvious use of superficial neck flexors and then relax. • Rolled towel is used at home as home exercise program. • Repeat this exercise for 7-10 times.
	Retraining cervical spine extension	Sitting on a chair with back straight. • The patient initiate cervical extension by asking the patient to slowly lift your chin up and try looking at the celling until you feel a discomfort • Return to the upright posture by bringing chin down first. • Repeat this exercise for 7-10 times.
	Extensors of cervical spine	Sitting on a chair with back straight. • Patients were instructed to flex the head and neck slowly • Return to the neutral position without excessive chin poke • Repeat this exercise for 7-10 times.
	Co-ordination of the neck flexors and extensors	Sitting on a chair with back straight. • Ask the patient to do the stable nodding movement. • Then instruct the patient to place the palm on the side of face and try to look in to the palm providing the resistance as a facilitating procedure for 10 seconds and then relax. • Repeat this exercise for 7-10 times
	Retraining Scapular orientation in posture	Sitting on a chair with back straight and placing both hands on your thigh. • Ask the patient to pull the shoulders backward and hold this position. • Instruct the patient to gently press down on the thighs with their hands. • Hold this position for 10 seconds and then relax. • Repeat this exercise for 7-10 times.
	Training scapular stabilizers	Prone lying • Now pull your shoulder backwards. • Hold it for 10 seconds and then relax. • Repeat this exercise for 7-10 times.
	Re-education in posture	Sitting with close to a wall while supporting back on the wall and is corrected from the pelvis. • Ask to press on the wall with back such that there are fewer gaps between the back and wall, and hold it. • Now pull both shoulders backwards such that there are fewer gaps between the shoulder and wall, and hold it. • Then perform a gentle nodding movement of the head. • Hold this position for 10seconds and then relax. • Repeat this exercise for 7-10 times

Table 2. Statistical analysis of pre and post-test data

Outcome Measures	Group	Mean Values		Mean Difference	Paired t test value	Significance
		Pre-Test	Post-Test			
HIT-6	A	60.26	51.6	-8.66	4.69	Significant (p<0.05)
	B	61.6	59.9	-1.7	16.70	Significant (p<0.05)
CV Angle	A	42.98	48.8	5.82	15.28	Significant (p<0.05)
	B	40.8	44.4	3.6	6.18	Significant (p<0.05)

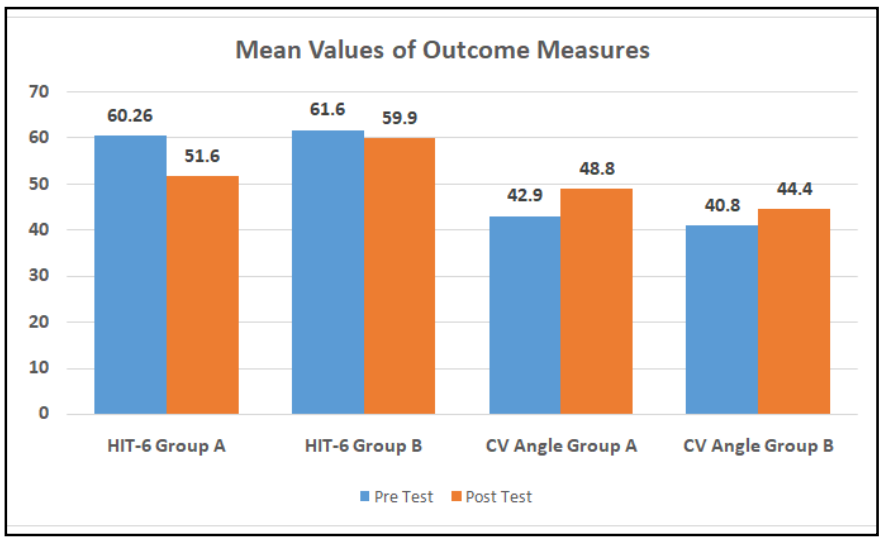

Figure 1. Mean values of outcome measures in Group A and Group B

When these mechanisms fails, it may causes adverse neurodynamics. Cervical slump test has been developed to find the adverse neural dynamics in patients with headache which can be treated by neural mobilization, which has been described forcervicogenic headache **(**Jull, 2002**).** The deep flexor muscles have a vitalrole in supporting the cervical segments and cervical curve. The weakness of this muscle contributes the increased cervical lordosis. This sustained posture may be considered as an aggravating factor when a headache is arising from the neck. Postural correction is considered to be essential for these patients in their daily activities.[7]The purpose of this study was to determine the effectiveness of neural mobilization and postural correction in treatment of cervicogenic headaches.

MATERIALS AND METHODS

We adopted an experimental study using purposive sampling technique. 30 subjects with the diagnosis of cervicogenic headache were divided into 2 groups of 15 each. Ethical clearance was obtained and informed consent form was signed by participants prior to recruitment to the study. Inclusion criteria included both genders within the age limit of 18 to 45 years who were diagnosed with cervicogenic headache with neck stiffness or pain and restricted cervical range of motion (ROM), with a positive slump test and a cranio-vertebral angle of less than 50 degrees.

Patients with other types of headaches such as migraine, hemicranial continua, tension type headache, myofascial pain syndrome, cluster headache, or those caused due to trauma, injury or due to cranial or vascular disorders were excluded. Group A received neural mobilization and postural correction as treatment for cervicogenic headache whereas group B was administered only postural correction exercises. (Table 1) The treatment duration was for 4 weeks, 3 days per week. The outcome measures used were Headache Impact Test (HIT) -6 and improvement in cranio-vertebral angle assessed using UTHSCA Image Tool software version 3.0. Outcome measures were assessed before administration of any therapy (pre-test) and after 4 weeks of therapy (post-test).

RESULTS

Out of the thirty patients under consideration, 18 were females and 12 were males. Each group consisted of 9 females and 6 males. The mean age of the participants were 28.2±4.5 years. The mean values of the outcome measures assessed in both groups are depicted in figure 1. Independent t test performed for the pre-test values showed homogeneity between group A and B. The paired t test analysis demonstrated that significant changes ($p<0.05$) were seen in both outcomes measures for group A as well as for group B (Table 2).

In terms of mean difference, group A demonstrated a difference of -8.66 between pre and post-test values of HIT-6. A negative value indicates a net reduction in scores post treatment. Group B showed a difference of -1.7. On analysing changes in cranio-vertebral angle, group A showed a difference of 5.82 degrees whereas group B showed 3.6 degrees. Thus it was evident that group A had a better prognosis than that of group B in both the outcome measures even though significant post-test changes were identified in both groups.

DISCUSSION

Headaches are a major problem of the general population. Almost 18% of the headaches are cervicogenic in nature, and cervicogenic headaches have a substantial effect on the quality of life. Structural innervated by the first three cervical nerves C1- C3 has been shown to be capable of producing cervicogenic pain. Physical therapy plays an important rolein the management of cervicogenic headaches. The forward head posture in cervicogenic headache patients causes more strain over neck. Muscle damage [especially cervical muscles] and pain and its posture leads to alter the values of craniovertebral angle from normalrange. This also indicates the presence of deep cervical muscle weakness and pain. It has been proposed in various literature that there is a relationship exist between deep cervical muscle coordination and forward head posture in cervicogenic headache patients. The study done by Kaur J et al. showed that combined postural correction and neural mobilization showed improvement in a patient with cervicogenic headache (Kaur, 2016).

They suggested that cervicogenic headaches are originated from the disorders in cervical spine. Paul Mc Crory have stated that cervicogenic headaches are caused by abnormalities in joints, muscles, fascia, and joint structures of cervical spine.[9]Furthermore, Jull et al. found that the effectiveness of therapeutic exercise and manipulative treatment was not substantially affected by age, gender, or headache chronicityin patients with moderate to severe pain intensity (Jull, 1999). However, both mobilization and manipulation are effective for treatment of patients with cervical pain. In this study, neural mobilization found to be effective in reducing pain and improving cranio-vertebral angle in patients with cervicogenic headache. This is due to the fact that the reduction in the ROM is due to the articular dysfunctions. Hence the articulardysfunctions should be addressed using joint mobilization techniques which may reduce the neural tension. The goals of postural correction exercises are focused on improving cervical muscle strength and correcting the forward head posture. In this study, the patients who received this intervention were instructed to do the exercises with concentration over the movements without holding the breath. Holding the breath will build up tension in the body and inhibit the supply of oxygen to the muscles and thus reduces the performance of the muscles.

Conclusion

We suggest that neural mobilization and postural correction exercises are effective treatment strategies when combined, in reducing pain and improvingcranio-vertebral angle in patients with cervicogenic headache, than by administering postural correction exercises alone. Limitations of this study were of small sample size, shorter age range, and inclusion of patients with unilateral headache only.

Conflict of interest Statement: The authors declare no conflict of interest.

Funding Statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Key Points

- Adverse neurodynamics as well as altered biomechanics contribute to cervicogenic headache.
- Neural mobilization along with postural correction exercises provide better results in the treatment of cervicogenic headache.
- Improvements are seen in terms of pain as well as on cranio-vertebral angle.

REFERENCES

Al Khalil Y, Jain S, Murphy PB. 2020. Cervicogenic Headache. [Updated Apr 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing;.

Biondi DM. 2005. Cervicogenic headache: mechanisms, evaluation, and treatment strategies. The Journal of the American Osteopathic Association. 2005; 105: 16S-22S.

Headache classification committee of the international headache society (IHS). The international classification of headache disorders, 3rd edition. Cephalalgia. 2018; 38(1): 1-211.

Hunt C. 2002. Peripheral nerve biomechanics - application to neural mobilization approach. Physical Therapy Reviews. 7: 111-121.

Jull G, Barrett C, Magee R, Ho P. 1999. Further clinical clarification of the muscle dysfunction in cervical headache. *Cephalalgia*. 19(3): 179-85.

Jull G, Trott P, Potter H, Zito G, Niere K, Shirley D, et al. 2002. A randomized controlled trial of exercise and manipulative therapy for cervicogenic headache. Spine. 27(17): 1835-43.

Kaur J, Malik M, Rani M. 2016. Efficiency of neural mobilization and advice in postural correction in cervicogenic headache: a case report. *Int J Physiother.,* 3(6): 726-730.

McCrory P. 2000. Headaches and exercise. *Sports Med*. 30(3): 221-229.

Page P. 2011. Cervicogenic headaches: An evidence - led approach to clinical management. *The International Journal of Sports Physical Therapy.* 6 (3): 254-264.

Sjaastad O, Fredriksen TA, Pfaffenrath V. 1998. Cervicogenic headache: Diagnostic criteria. Headache. 38: 442-445.

****