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Effect of Craniosacral Therapy in Treatment of Cervical Spondylosis

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Abstract

Study design: Pre-post experimental study design. **Background:** Degenerative changes around neck involve ligaments and cartilages. These are the major reasons behind cervical root involvement and dysfunction. These in long run can have adverse effects like-vision disorder, hypertension and much more. **Objective:** Hence, present study was undertaken to add on to available treatment methods for cervical spondylosis and to find out the effectiveness of Craniosacral therapy (CST) for treating cervical spondylosis. **Procedure:** In this study, 30 participants were recruited based on inclusion and exclusion criteria. CST was administered to them for a period of 2 weeks, 3 sessions per week. Pre and post assessment were taken using following outcome measures-Neck Disability Index (NDI), Range of Motion (ROM), Numerical Pain Rating Scale (NPRS) **Results:** There was significant decrease in NDI and NPRS in patients which is suggestive of improving their quality of life. Also, cervical ROM was found to be significantly increased amongst these participants. The outcome of NDI, NPRS and Cervical ROM was statistically analyzed. It was found to be effective with highly significant P value <0.001 using SPSS software v.25. **Conclusion:** Craniosacral therapy (CST) is an effective treatment and can be used for treating patients with cervical spondylosis.

Keywords: Cervical spondylosis, Craniosacral therapy, Neck Disability Index (NDI), Numerical Pain Rating Scale (NPRS), Range of Motion (ROM).

Introduction

Wide base with clumsy hands and jerky gait with stooped posture of elder people has been explained throughout the ages. Similarly, pain in the neck and upper limb has turned out to be an ever-present condition occurring with aging which is “pain in the neck” is the commonly quoted term in our language as a “figure of speech”.¹ Some authors also quoted cervical spondylosis as “Mother” to myelopathy and radiculopathy. Patients that present with neck pain have symptoms which can be classified on mechanical basis or posture. Aetiological factors which are generally less understood and usually

occur with multiple factors, like- postural abnormality, depression, anxiety, strain at the neck region, due to playing sports or occupation related activity and much more.^{2,3,4} Investigations that are generally used for diagnosing cervical spondylosis include plain x-ray or other radiographic investigations of cervical spine. There appears loss of normal cervical lordosis, which is suggestive of muscle spasm, reduced joint space, osteophyte lipping around the involved vertebrae. These are some of the typical findings and are clearly an indicative of degenerative changes at vertebral level.^{3,5} Degenerative changes of and around the cervical spine, can also involve ligament and cartilaginous structure. These changes are usually the leading reason to cervical root and cervical cord dysfunction.⁶ But many a times these degenerative changes may remain asymptomatic. A study says that radiographic evidence of cervical spondylosis with no distinct symptoms are seen more commonly, the incidence is of 50% in the age group of 30-40 years and 85% in the age ranging between 40-

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50 years.⁴ Human body reacts to any sort of changes in the body. This abnormal state is responded by the body by bridging bony deposits which are produced in and around the vertebrae known as marginal osteophytes. If the process continues to be successful and undergoes completion can result in 'auto-fusion'.⁵

Biomechanics: With cervical spondylosis, as the chronicity of the condition increases, the disc continues to lose its height ventrally and increased kyphotic posture. Which results in increased loading, increase in moment arm around or at the center point of rotation. However, alteration of posture increases axial loading, which then along the course of cervical spine leads to changes at the ventral column of the spine. Due to these changes, the stabilizing structures are not able to maintain these loads as there is transfer of stress to the surrounding bony structures. When an axial load is applied there is loss of normal lordotic posture which gives rise to a greater moment arm at the point of rotation. There will be induced progression of kyphotic posture if further loading of axial spine occurs.⁷

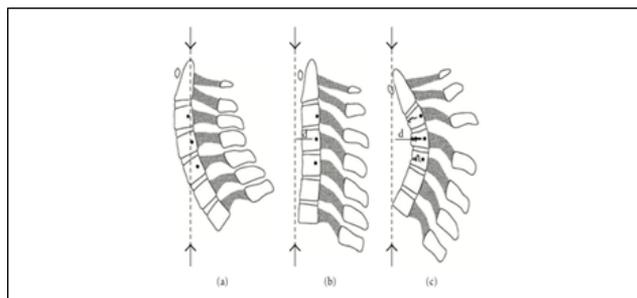


Fig 1: Biomechanical Changes in Cervical Spine due to cervical spondylosis⁷

Effects of Cervical Spondylosis

Neck Pain: Cervical spondylosis leads to increased mechanical stresses on at the cartilaginous end plate on vertebral body lip. It result in sub periosteal bone formation that harms nervous tissues. There might also occur thickening of the bone and ligaments, ligamentum flavum is most commonly affected. ⁸ Degenerative changes, increased mechanical stress and loading on the bone, osteophyte formation, thickening of the ligaments all of these contribute to neck pain.

Postural changes: Loss of normal lordotic cervical curvature occurs with increased chronicity of the condition. This alters the load bearing at the vertebral level and accelerates the condition leading to further deterioration. Along, with increased kyphotic

posture, there also occurs a change in the head and neck alignment. i.e., anterior translation of the head with respect to cervical spine. This in general terms is called as- Forward Head Posture. Accompanying the said two postural changes is the protracted shoulder. Also, with protracted shoulders there occurs tightness of pectoralis minor muscle.⁹

Reduced Cervical range of motion (ROM): Change in posture, position of vertebrae with respect to the condition also has an effect on muscles. Alteration in motor function occurs with cervical spondylosis. Dysfunction of deep cervical flexor muscles and inappropriate length of muscles connected to neck region along with pain are one of the major contributing factors to reduced cervical flexion and extension ranges.^{10,11,12,13} Considering so many ill-effects of one single condition, one can imagine its effect on one's quality of life. Hence, aim of this study was to study the effect of craniocervical therapy in treatment of cervical spondylosis.

Method

Ethical clearance was obtained from the Institutional Ethical Committee. 30 participants meeting the inclusion and exclusion criteria and who were willing to participate in the study were included.

Inclusion criteria

- Patients willing to participate
- Age group 30 to 50 years.
- Patients diagnosed with cervical spondylosis by orthopedic.
- Patients with impaired Neck Disability Index score < 40%.
- Positive Spurling's test.

Exclusion criteria

- Recent fractures
- Visual impairment
- Surgery if any, done

The subjects were then assessed for the outcome measures using NPRS, NDI and Cervical ROM pre-intervention. After this procedure, craniocervical therapy was administered to them for a period of 2 weeks; 3

sessions per week post which patients were assessed again for the said outcomes.

Intervention Procedure^{14,15}

Before starting with the test participants were instructed not to undergo any other intervention for neck pain.

Intervention included following techniques:

- Still Point Induction
- Occipital Decompression
- Cranial Vault with Traction
- Still Point Induction

Still Point Induction

The head was cradled with cupped hands so that the temporal mastoid process did rest on thenar eminences and fingers extended caudally along the neck. Thumbs touched together and listen for the cranial rhythm at the mastoids. On cranial flexion the mastoids approximated, on extension they separated. This motion was felt at the elbow at triceps level. Following the motion of flexion by subtly compressing thenars together to accompany the mastoids as they approximate. Then, they gently but firmly resisted the separation of the mastoids as cranial extension began. The same procedure was then repeated. After a few cycles quick pulsations were felt as the craniosacral system began to disorganize, and then the rhythm did stop.



Fig 2: STILL POINT INDUCTION

Occipital Decompression

Head was the hands and ring finger was placed under the occiput pointing into the ring of the atlas. The head was allowed to relax onto the therapist's fingers until the

suboccipital musculature lets it in, in the posterior ring. Once the release is felt, both the pinky fingers were used to reach up to the either side of the external occipital crest and gentle traction was applied. This traction was continued down the dural tube.



Fig 3: OCCIPITAL RELEASE

Cranial Vault with Traction

In the vault hold, the patient was in supine and the therapist comfortably seated at the side of patient's head. Fingers and thumbs "fanned out" so that the fifth fingers were in contact with the patient's occipital squama. The fourth fingers were in contact with the occiput, just posterior to the occipitomastoid sutures. The third fingers were applied to the mastoid processes of the temporal bones with the fingertips running inferiorly over the mastoid tips. Neither of the fourth or third fingers actually overlay the occipitomastoid sutures. These fingers were parallel to the suture on both sides. The patient's external ear pinna was straddled by the space between your third and index fingers. The index fingers were allowed to rest anterior to the ear so that their tips approximately overlay the temporomandibular joints bilaterally, depending, of course, upon head size and finger length. Your thumbs were placed over the region of the great sphenoid wings, while your palms were allowed to gently rest over the temporal squama, the temporoparietal sutures and the parietal bones.



Fig 4: CRANIAL VAULT TRACTION

Results

A total of 30 subjects were recruited for the study. In our study we considered cervical as a single entity and all the subjects having neck pain. They were evaluated before and after at 2 weeks. The demographic characteristics of the participants were presented in Table 1 & 2. There is a positive significant difference in mean difference of all cervical range of motions, the pre

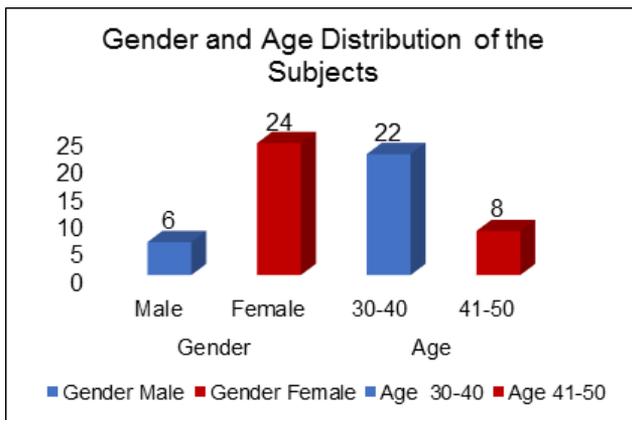
and post assessment of these ranges show an increase of range of motion ($p < 0.001$) (Table 3). In the present study, the intragroup analysis of mean NPRS and NDI values in the subjects which revealed significant improvement at 2 weeks ($p < 0.001$) and also revealed significant decrease in the mean difference of NPRS and NDI scores between the pre and post assessment of the subjects (Table 4).

Table 1: Gender and Age distribution of subjects in study group

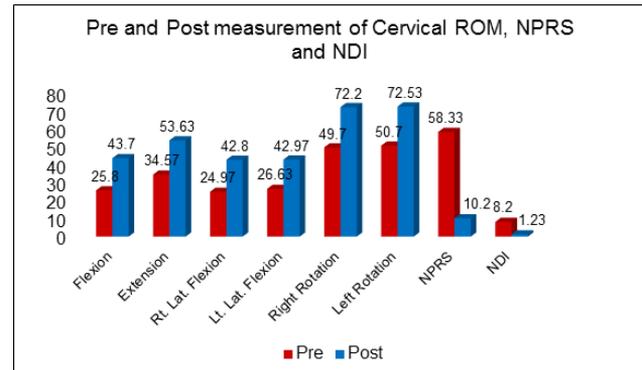
GENDER			AGE		
Gender Type	No. of Patients	Percentage (%)	Age (Years)	No. of patients	Percentage (%)
Male	6	20	30-40	22	73.33
Female	24	80	41-50	8	26.67
Total	30	100	Total	30	100

Table 2: Comparison of pre and post assessment Cervical Range of Motions (ROM), NPRS and NDI in study group.

	Cervical Ranges						NPRS	NDI
	Flexion	Extension	Rt. Lat. Flexion	Lt. Lat. Flexion	Right Rotation	Left Rotation		
Pre	25.8	34.57	24.97	26.63	49.7	50.7	58.33	8.2
Post	43.7	53.63	42.8	42.97	72.2	72.53	10.2	1.23
p Value	<0.001							
t Value	18.30	16.67	18.41	15.58	10.74	10.57	4.84	4.79



Graph 1: Gender and Age Distribution of Patients Participating in the Study



Graph 2: Pre and Post ranges of Cervical ROM, NPRS and NDI of all the patients

Discussion

The craniosacral therapy (CST) is an osteopath foundation of John Upledger. This technique was usually practiced by osteopaths and chiropractors. CST is a form of 'subtle' therapy which involves light touch which holds the skull. CST manipulation has an effect on the circulation of CSF, which leads to profound therapeutic effects.⁶ Certain studies state that specific manual therapy techniques including Craniosacral therapy can induce an improved effect on health, healing can occur from acquired injuries of the spine and nerves. The soft touch, gentle traction and various techniques induces pain reduction and there was also increase in cervical ranges and improvement in neck functions.¹⁶ CST has an effect on broad nociceptive and low-threshold mechanosensory innervations of the fasciae. While applying CST, fasciae are also treated which induces decrease of muscle tension, muscle tone of intrafascial muscle cells and increases parasympathetic nervous system response. Pain relief causes deep relaxation of the participants muscles.^{17,18} The result of our study has been supported also by Heidemarie Haller et al.¹⁹ where 54 participants were included and treated with CST for chronic neck pain for a period of 8 weeks. The study concluded that CST has a significant effect in reducing pain and improving functional disability of the participants suffering from chronic neck pain. Craniosacral therapy has also been useful in relieving pain due to fibromyalgia. 92 patients were included and treated with CST for 20 weeks. Patients were assessed for pain intensity and heart rate variability. At the end patients were re-assessed and the study concluded that CST had a positive effect on pain intensity.²⁰ Another reason for pain reduction was proposed by Adelaida Maria Castro-Sanchez which stated that CST leads to alterations in the levels of hemoglobin and oxygen saturation, serum potassium, systolic BP, lactic acid and magnesium which has its role in pain alteration. Also, the treatment focuses on connective tissues of the skull, spine and CSF. These structures have influence on central nervous system from physiological as well as via autonomic nervous system.^{21,22} Greenman concluded that reduction in pain due to CST is due to reduction in articular and membranous restrictions, which reduces neural entrapment at the base of the skull. This enhances amplitude of cranial rhythm, reduces venous congestion and improves spinal cord motion.^{23,24} Another possible mechanism given for pain reduction is "healing touch."

With this "healing touch," the goal is in maintaining the balance of vital energy fields of the body. Which is based on the concept of therapist's healing force affecting on the patient's recovery.²⁴

Conclusion

Craniosacral Therapy has a therapeutic effect on reducing pain, improving cervical range of motion and improving overall cervical function amongst people with cervical spondylosis.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Taken from Institutional Sub-Ethics Committee of Dr. D. Y. Patil College of Physiotherapy, Pune.

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