Original Research Article

Correlation of Cervical Core Muscle Strength and Neck Pain in Teachers

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ABSTRACT

Background: Neck pain is one of the most significant health problems due to stress of work that is linked with many causes including physical and psychological stress.
There are some of the risk factors believed to alter posture and cause neck pain and may be hazardous to the health of teachers, whose professions involves repetitive movements like writing, in addition to prolonged standing, as well as daily computer use. Some of Psychosocial risk factors that are believed to cause neck pain includes stress of workload, coping ability, social support is included.
Teaching is considered as one of the professions where incidence and prevalence of neck pain is high. So, aim of the study is to find out correlation of cervical core muscle strength and neck pain in teachers.
Methodology: The correlational study was conducted on teachers of colleges and universities of Ahmedabad. Thirty teachers aged between 25 and 40 years with experience of minimum 1year or more than 1 year and those who have neck pain and trapezius pain since for past three months were invited to participate in this study. Teachers with pain score of 3 or more in visual analogue scale and neck disability index score of 5 or more than 5 were included. Neck disability index was used for assessing neck pain. Cervical core muscle strength was assessed by using pressure biofeedback device.
Result: Correlation was done by using Spearman's Rho correlation. The data analysis revealed that r value is -0.648 and p value is < 0.001
Conclusion: This study shows that there is moderate correlation between cervical core muscle strength and neck pain in teachers.

Keywords: cervical core muscle strength, neck pain, teachers

INTRODUCTION

Traditional teaching methods such as using textbooks for teaching, are gradually being enhanced and replaced by new IT forms such as internet sources and interactive multimedia software. These teaching techniques have resulted in an increase in the number of classes that involve computing. Prolonged working hours on computer is associated with holding a static posture for long-period of time which is most concentrated in the shoulder and neck region, resulting in increased forward neck flexion and increased static muscle tension in this region. Increased forward neck flexion may result in increased muscle tension of particular muscles, as well as increasing compression forces in the articulation of the cervical spine, resulting in a higher risk of work-related muscular disorders [1]
The Deep Cervical Flexor muscles (longus capitis and colli) acts as an important stabilizer of the head-on-neck posture. It has been theorized that when performance of muscle is impaired, the balance between the

deep cervical flexors and stabilizers on the posterior aspect of the neck will be disrupted, resulting in loss of proper alignment and posture, which is then likely to contribute to cervical impairment.[1]

Longus colli and Longus capitis are important muscle stabilizers of head on neck posture with major function of maintaining cervical lordosis especially during functional movements. Deep cervical flexors have high density of muscle spindles leading to kinesthetic sense, and their action is influenced by variation of resting head position.[2]

Neck pain is described as a chronic episodic condition characterized by persistent, non-transient or fluctuating pain.[3]

Neck pain can be of: -

Axial neck pain (felt mostly in the neck) or radicular neck pain (pain shoots into other areas such as the shoulders or arms). It can be acute neck pain (lasting from days to up to 6 weeks) or chronic neck pain (lasts longer than 3 months to years).

Neck pain feels like:

A persistent ache.

A stabbing or burning pain.

Neck pain combined with headache and numbness or tingling in one or both arms.

Increased tightening in the muscles in the neck.

Cervical spine is lordotic (convex anteriorly) curvature having seven vertebrae which are smaller in size than rest of the vertebral column. First& second vertebrae (atlas & axis) of whole spine are atypical making atlanto-occipital & atlanto-axial joints.[4]

A prevalence of 73.5% neck pain was reported in a study of teachers in India.

It is considered to be one of the most common occupational disorders, and the physical nature of teacher's job is considered to be as a risk factor for development of neck pain in them. Risk factors includes improper posture like bending the head forward, work-related psychosocial aspects such as work situation, work demands, lack of support from co-workers.[4]

Changes from conventional to modern teaching methods have been identified as the main cause of stress among them.[5]

Neck pain relates the potential damage to structures of cervical spine. Research has shown that impairment of deep cervical flexor (DCF) muscles leads to insufficiency in coordination, activation, poor support and overload on cervical structures that further lead to altered neck posture and development of neck pain.

Teaching is one of the professions where the incidence and prevalence of neck pain is high. So, aim of the study is to find out correlation of cervical core muscle strength and neck pain in teachers.

MATERIALS & METHODS

Study design and data collection: The correlational study was conducted on teachers of colleges and universities of Ahmedabad. Teachers with pain score of 3 or more in visual analogue scale were included. Thirty teachers aged between 25 and 40 years with experience of minimum 1year or more than 1 year and those who have neck pain and trapezius pain since three months were invited to participate in this study.

Teachers fulfilling the inclusion criteria were explained about the study and written informed consent form was taken from them.

They were asked to fill Neck disability index scale and then those teachers fulfilling the criteria with neck disability score of 5 or more than 5 were checked for cervical core muscle strength by using pressure biofeedback device.

TESTING OF CERVICAL CORE MUSCLE STRENGTH

Subjects were in supine lying position, and the air unit of pressure biofeedback was placed at the posterior aspect of the cervical spine just below the occiput and inflated to a baseline of 20 mmHg (red band).

The movement the subject is to perform is a gentle nodding of the movement as if they were saying "yes".

Instruction was given to the subject to place the tongue on the roof of the mouth, lips together but teeth just separated. This will discourage substitution with the platysma or hyoids.

Then subjects were instructed to gently nod to target 22 mmHg and hold this position for 10 seconds.

If the subject was able to hold the position steadily, the whole procedure was repeated for 24, 26, 28, and 30 mmHg, by providing rest for 30 seconds in between each reading. Final reading was taken when the subject was not able to hold the specific pressure for 10 seconds.

Before the test, subjects were given enough time to practice and examiner observed for any substitution movements during the test. Test was considered poor if subjects could not hold the position at 26 mmHg.

The data was analysed using SPSS 20 software.

RESULT

Correlation was done by using Spearman's Rho correlation. The data analysis revealed that

r value is -0.648 and p value is < 0.001.

Correlations

			C.C.M	N.D.I
Spearman's rho	C.C.M	Correlation Coefficient	1.000	-.648[**]
		Sig. (2-tailed)	.	.000
		N	30	30
	N.D.I	Correlation Coefficient	-.648[**]	1.000
		Sig. (2-tailed)	.000	.
		N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).
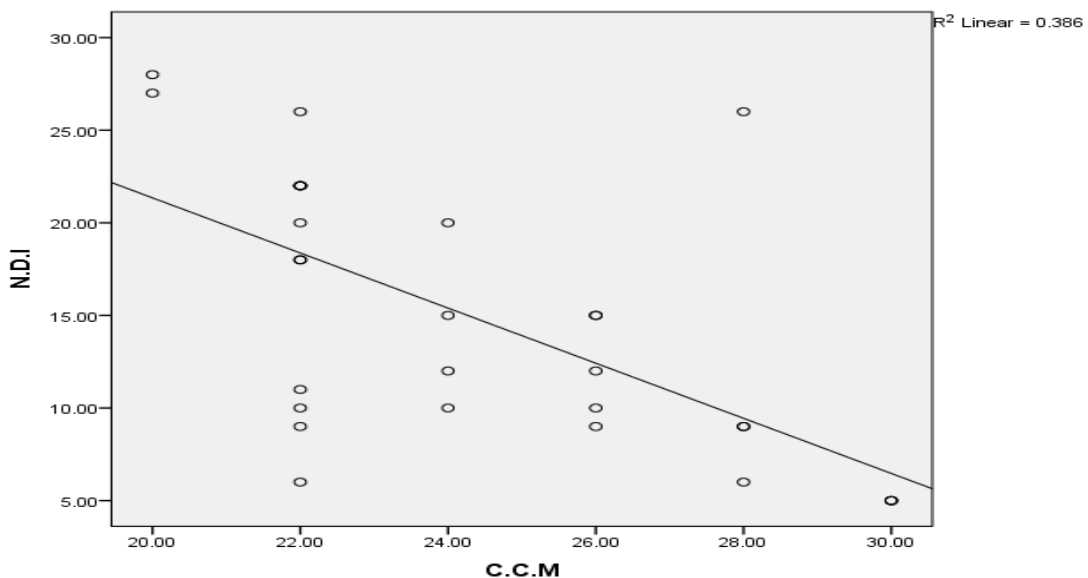
Graph showing the correlation of cervical core muscle strength and neck pain in teachers

DISCUSSION

The main purpose of the study is to determine the correlation of cervical core muscle strength and neck pain in teachers.

There is increasing evidence of impaired cervical flexor muscle function in neck pain disorders. There are earlier studies that focused on, and demonstrated, a reduction in flexor strength and endurance. By viewing past literature correlation between these two factors are need to be strongly determined.

The present study was conducted on teachers of colleges and universities of Ahmedabad to find out correlation of cervical core muscle strength and neck pain in teachers.

Data was collected from various colleges and universities of Ahmedabad. 30 subjects including both male and female are taken into the study. Aged between 25 and 40 years.

In teachers with neck pain; the cervical core muscle strength is decreased. Teachers with high nek disability index scores had decreased cervical muscle strength readings compared to that of teachers with less neck disability index scores.

Prolonged teaching hours leads to neck pain. Various pathologies of cervical spine are responsible for development of neck pain. There are number of risk factors responsible for origin of neck pain. These factors can be categorized as individual, physical & psychological risk factors. Literature review suggests that neck disorders are often associated with abnormal neck posture.[5]

It is considered to be one of the most common occupational disorders, and the physical nature of teacher's job is considered to be as a risk factor for development of neck pain in them. Risk factors includes improper posture like bending the head forward, work-related psychosocial aspects such as work situation, work demands, lack of support from co-workers.[5]

Such serious outcomes suggest that greater stress should be placed on prevention of such disorders. This can be done through ergonomic education, regular physical exercises, and decreased wok stress.[5]

Limitation

The study was conducted on small population.

Participants criteria of this study were limited with regards to age 40 years old.

Recommendation For Future Study

Study can be done with large sample size. Further studies should be conducted in older age groups.

CONCLUSION

We concluded that there is moderate, negative correlation between cervical core muscle strength and neck pain in teachers.

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