ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 09 | September - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CORRELATION OF SCAPULAR POSITION WITH NECK PAIN IN SECONDARY SCHOOL TEACHERS

Physiotherapy

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ABSTRACT

BACKGROUND AND AIM: Musculoskeletal disorder is one of the most common and important occupational health problems in working population. Neck pain is common musculoskeletal complaint. The purpose of the study was to correlate the scapular position using lateral scapular slide test with neck pain using visual analogue scale in secondary school teachers. Our study examined whether the pain intensity varied with change in scapular position.

METHODOLOGY: A Cross-sectional Observational study was done with a population of 30 participants within a year. Purposive sampling technique. 25 to 40 years female Secondary school teachers with neck pain having experience of 3 years and above were included. Any recent history of fracture, surgery of shoulder, upper limb, neck or thorax, any fixed spinal deformities or any neurological disorders related to upper limb were excluded. Demographic data was documented and pain history was evaluated by VAS scale and scapular dyskinesia was measured using Lateral scapular slide test.

RESULT: According to lateral scapular slide test as the position of hand changed the pain intensity increased.

CONCLUSION: It was concluded that there is positive correlation of the scapular position and neck pain in secondary school teachers with neck pain more at 90-degree of shoulder abduction and internal rotation.

KEYWORDS

Lateral scapular slide test, Visual analogue scale, Scapular dyskinesia.

INTRODUCTION

Musculoskeletal disorder is one of the most common and important occupational health problems in working population.[1] Neck pain is common musculoskeletal complaint and scapular dysfunction has been implicated in the pathogenesis of neck pain is scapular dysfunction. [2] Abnormal or altered scapular position is defined as an observable alteration in the position and motion of scapula relative to thoracic cage. [3] Scapula share common muscle attachments with neck and it has been proposed that altered axio-scapular muscle function potentially contributes to neck pain due to abnormal loading of cervical spine. [2]

Education is a professional field, and proportion of female teachers is rising. The work tasks of school teachers often involve significant use of a head down posture, such as frequent reading, marking of assignments, preparing lessons and writing on a blackboard. [4, 1] The repetitive task predisposes teachers to scapular muscles fatigue, imbalance or weakness, postural abnormality, lack of muscular capsular flexibility etc. Thus resulting in alteration of this normal scapulohumeral rhythm.[5]

Learning environment for children is progressively being facilitated by new forms of information technology (IT). These initiatives have resulted in an increase in the number of classes that involve computing. [6] Long duration of computer work is associated with prolonged periods of static posture, which is most pronounced in neck and shoulder region resulting in increased forward neck flexion and increased static muscle tension in this region.[6]

Poor working posture will further lead to imbalance of scapular muscle activity especially excessive loading of scapular muscles.[7] Neck pain among teachers has been positively associated with female gender in number of studies.[1] A study on prevalence of neck pain in world population which stated that women reported more Neck pain than men with a prevalence of 83%.[8] It has been suggested that women might be more likely to report pain than men because women have lower physical strength, pressure from family and career prospects or simply that men and women have different traditions and thresholds for when and how they report pain. (1)

Kibler, described a test to clinically measure static scapular positions called the lateral scapular slide test (LSST). A bilateral difference of 1.5 cm (15 mm) should be the threshold for deciding whether scapular asymmetry is present.(9) The Visual Analogue Scale (VAS) is used to measure pain. The VAS is a continuous scale consists of a horizontal or vertical straight line, usually 10 cm in length. They are asked to place a line perpendicular to VAS line at the point that represents their pain, and then the distance is measured.(10)

Epidemiological studies, have defined repetitive work for neck as work activities that involve continuous arm and hand movements which affect neck/shoulder musculature and generate loads on neck/shoulder area resulting in altered scapular position. (7) Hence the aim of the study was to correlate scapular position with neck pain in secondary school teachers.

METHOD

Ethical clearance was obtained from the Institutional Ethical Committee where the study was conducted.

Duration of study 1 Year. Sample size was 30 and was calculated by Pilot study on 10 samples of age 25 to 40years of secondary school teachers having neck pain.

Purposive sampling technique was used.

Inclusion criteria was Secondary female school teachers of age group of 25 to 40 years with neck pain and teaching experience of 3 years and above.

Participants with any recent history of fracture, surgery of shoulder, upper limb, neck, thorax, any fixed spinal deformities or any neurological disorders related to upper limb were excluded. Written consent was taken from the subjects.

Demographic data was taken and pain history was evaluated by VAS scale.

Subject were asked to be in standing position and their upper back was exposed with their hands at sides and shoulders relaxed.

The inferior angle of scapula and the spinous process of vertebra corresponding to it was marked. LSST measurements were taken by measuring the distance from inferior angle of scapula to the nearest vertebral spinous process using Vernier calliper in 3 different positions: - Shoulder at neutral, Shoulder at 40-45 degree of abduction with hands on hip, Shoulder in 90 degree of abduction and internal rotation.

Bilateral difference of 1.5cm (15mm) should be threshold for deciding whether scapular asymmetry is present.

HAND POSITIONS FOR LATERAL SCAPULAR SLIDE TEST

Fig 1: With shoulder in neutral keeping hands at sides.

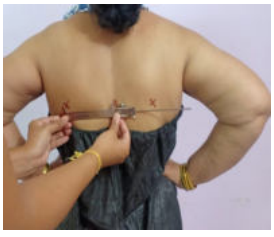


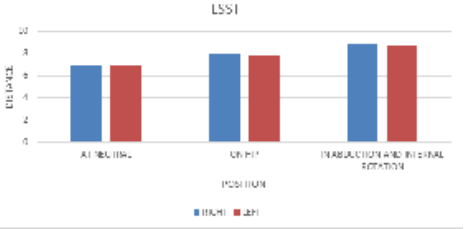
Fig 2: With shoulder in 45-degree abduction keeping hands on hip.

Fig 3: With shoulder in 90-degree abduction and in internal rotation.

RESULTS

Table 1: Lateral Scaplar Slide Test (lsst):

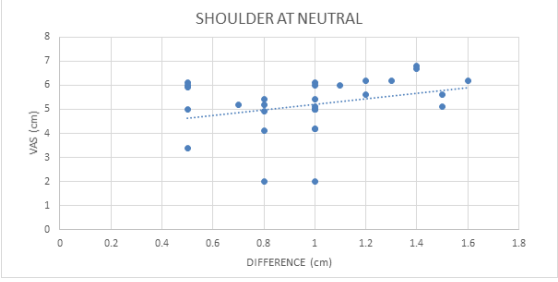
SIDES	AT NEUTRAL		ON HIP		IN ABDUCTION AND INTERNAL ROTATION	
	MEAN	SD	MEAN	SD	MEAN	SD
RIGHT	7	0.98	7.99	1.04	8.90	1.12
LEFT	6.92	0.94	7.82	0.92	8.71	1.08



INTERPRETATION: This graph shows the mean values of scapular distance of right and left side with shoulder in neutral, at 45- degree abduction with hands on hip and shoulder in 90- degree abduction and internal rotation.

Table 2: Correlation Of Scapular Position With Neck Pain With Shoulder At Neutral:

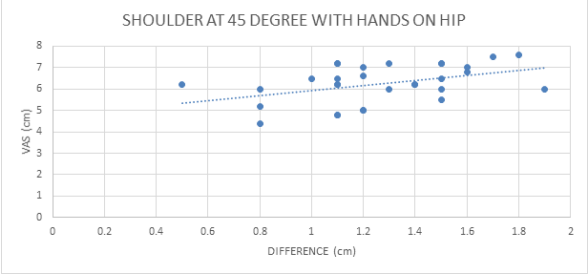
OUTCOME	MEAN	SD	r value	p value	Significant/non-significant
VAS	5.18	1.16	0.43	0.017	Significant
LSST	0.98	0.31			



INTERPRETATION: This suggests that there is a moderate correlation of neck pain with scapular position in shoulder at neutral position.

Table 3: Correlation Of Scapular Position With Neck Pain With Shoulder At 45 Degree, Hands Resting On Hip:

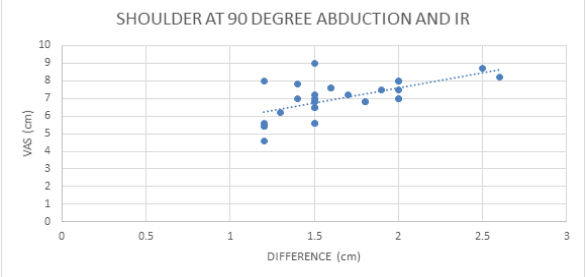
OUTCOME	MEAN	SD	r value	p value	Significant/non-significant
VAS	6.25	0.87	0.41	0.02	Significant
LSST	1.26	0.31			



INTERPRETATION: This suggests that there is moderate correlation of neck pain with scapular position in shoulder at 45 degree, hands resting on hip.

Table 4: Correlation Of Scapular Position With Neck Pain With Shoulder At 90 Degree Abduction And Internal Rotation:

OUTCOME	MEAN	SD	r value	p value	Significant/non-significant
VAS	6.96	1.03	0.58	0.001	Significant
LSST	1.63	0.36			



INTERPRETATION: This suggests that there is large correlation of neck pain with scapular position in shoulder at 90 degree of abduction and internal rotation.

DISCUSSION

A cross- sectional observational study was done in secondary school teachers to correlate the scapular position with neck pain at 3 different levels, shoulder at neutral, at 45 degree with hands resting on hip and at 90- degree abduction and internal rotation. The pain was assessed using VAS and scapular positions distance was measured using Vernier calliper using LSST.

As job nature of secondary school teachers involve lot of head down posture for frequent reading, assignment correction, writing on blackboard requires overhead activities, and now with replaced and advanced new forms of computer use, it is causing more of awkward postures leading to increased neck pain due to increased static loading and increased muscle tension.[4]

Neck pain from poor posture can be explained in an upright position where the head is supported by spinal vertebrae.[3]The scapula is bridge between shoulder and cervical region and plays very important role in providing both mobility and stability for neck and shoulder region. Disturbance in this scapular muscle function can induce mechanical loading on cervical segments and create implication for the initiation of neck pain.[7] Change in the curvature of the neck bone causes upper-crossed syndrome due to an imbalance in muscular pattern, which subsequently leads to rounded shoulder posture.[9]

Melaku Hailu Temesgen did a study which showed elevating arm above shoulder during writing on board was 2.71 times more likely to

develop a chance of shoulder neck pain compared to not elevating arm above shoulder. Possible reasons could be, working with raised arms above unsupported shoulder for a long time can cause friction, tension, and strain over cervico-brachial regions. The activation and coupling of scapular muscles during overhead activities is responsible for upward rotation, external rotation and posterior tilt of the scapula.[11]

The results of the present study show that there is a significant correlation in the scapular position with neck pain at all three positions. As this study shows that in all the three positions, scapular protraction value differs but the scapular protraction is high when the subject places their hands on the hip as compared to in neutral and the VAS also increases at hip level as compared to in neutral. The highest value is at shoulder in 90degree abduction and internal rotation with highest score of Visual Analogue Scale. Thus, we accept the alternate hypothesis that there is significant correlation in scapular position with neck pain in secondary school teachers.

CONCLUSION

From this study, it is concluded that there is positive correlation of the scapular position and neck pain in secondary school teachers and neck pain which was more at 90-degree of shoulder abduction and internal rotation.

LIMITATIONS

- Only female subjects were taken.
- Small sample size used.

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