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THE SENSITIZING RESPONSE IN IPSILATRAL AND CONTRALATERAL LOWER LIMB STRAIGHT LEG RAISING DURING UPPER LIMB TENSION TEST 2A IN CERVICOBRACHIAL DISORDERS

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ABSTRACT

Background: Neck pain is increasingly becoming a common problem. Cervicobrachial disorder is a dysfunction of nerve root of the cervical spine due to its compression which leads to ischemic changes that cause sensory and motor dysfunction. Many studies has been done on SLR test which affects upper limb sensitizing response by means of doing ipsilateral and bilateral SLR. The study revealed that the abduction ROM for shoulder was greater during contra lateral SLR with ULTT-2a when compared to ipsilateral SLR.

Methods: 30 subjects (18 males and 12 females) were included in this study. The ULTT-2a is performed on each subject, following this ipsilateral and contra lateral SLR was performed. The sensitising response perceived by the subjects was recorded. Outcome measures were Range of Motion and sensation description. After the intervention the shoulder abduction and straight leg raising ranges were measured. Analysis was performed using independent t-test.

Result: Significant difference was found in shoulder abduction ($p< 0.001$) and SLR ($P< 0.002$) but no considerable difference was found on the VAS. ($P> 0.11$). There was no difference in sensitizing response (Tingling, Burning, Sharp shooting) during ipsilatral and contra lateral straight leg raise.

Conclusion: This study concludes that in order to obtain the same sensitizing response during ULTT-2a of contra-lateral SLR as during ULTT-2a of ipsilateral SLR, the angle of SLR and shoulder abduction during ULTT-2a of contra lateral SLR will be greater. This finding will be proved beneficial in the treatment of patients with cervico brachial disorders.

Keywords: CBD-Cervicobrachial disorders, ULTT 2A-Upper Limb Tension Test-2a, SLR-Straight Leg Raising

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INTRODUCTION

Musculoskeletal disorders constitute an important health problem. For a long time low back pain has been a dominant problem. However, pain from the shoulder and neck region now seems to occur more frequently. Pain around neck is usually associated with radiculopathy, which is collectively known as cervico-brachial disorder, because pain mostly originates from cervical spine. The cervical region is subjected to axial compression, tension, bending, torsion and shear stresses as in any other region of spinal column. Cervico-brachial disorder is a dysfunction of nerve root of the cervical spine due to its compression that leads to ischemic changes causes sensory and motor dysfunction [1].

Patho-physiology: degenerative changes starts in the inter-vertebral discs, its looses hydration and elastic properties by age, the disc space narrows and and eventually collapses. Osteophytes develop at the margins due to the collapse of intervertebral disc and osteophyte formation, the cross-sectional area of spinal canal is reduced. Hypertrophy of the facet joints also occurs [2]. Surrounding ligaments also lose their elastic properties and they become thick with age. Neck extension causes the ligaments to fold inward, further reducing the AP diameter of the spinal canal. Due to the narrowing of intervertebral disc space, narrowing of intervertebral foramina also occurs which in turn causes compression of the nerve root passing through that foramina [3]. Due to the compression of nerve root, inflammation of the dural sleeve occurs which causes adhesions around the nerve root. Compression also causes radicular pain along that nerve root which is called radiculopathy [5,6,7]. The study included that the peripheral neuropathic pain is because of injury to reduce root or peripheral nerve trunk by mechanical as chemical stimuli. Clinical manifestation includes positive and negative symptoms. Positive symptoms reflect an abnormal level of exhibitions in the nervous system and include pain, paraesthesia, and dysesthesia. Negative symptoms indicate reduced impulse conduction in neural tissue and hypoesthesia or anaesthesia and weakness. It has been proved that the conservative margin neuro dynamic mobilization technique can be effective in addressing musculoskeletal presentation of peripheral neuropathic pain [8]. Mobilization of the nervous system is an approach to physical treatment of pain. The method influences pain-physiology via mechanical treatment of neural tissues and the non-neural structures surrounding the nervous system. The musculoskeletal system exerts non-uniform stresses and movement in neural tissue, depending on the local anatomical and mechanical characteristics and the pattern of body movement. This response includes neural sliding, pressurization, elongation, tension and changes in intra neural micro-circulation, axonal transport and impulse traffic. Many events occur in body including tension, neural tension can battery explains by including mechanical and physiological mechanism. Neural tension test may be better described as neuro dynamic test [9].To examine median nerve the sliding in response to upper limb movement to determine whether the median can be unloaded. Ultrasound imaging of the median during 40 wrist extension, 80 shoulders abduction, 90 elbow extension and 35 contra lateral neck side flexion. The forearm and upper arm ranged from 0.3 mm for neck side flexion to 10.4 mm for elbow extension. Strain in the present for wrist extension was 1.1% (SEM 0.2%) and for neck side flexion 0.1% (SEM 0.1%). The median nerve is unloaded when the shoulder is adducted or elbow flexed. Total additional strain in forearm will be 2.5 – 3.0%. Median is appearing well designed to cope with change in between length causes by limb movement. Hence several studies shows that there is difference between contra lateral and ipsilateral SLR changes, objective of this study is to find out the sensitizing response in ipsilateral and contra lateral SLR during ULTT-2a in cervico-brachial disorder

METHODOLOGY

30 subjects both male and female with the age group between 35 – 40 years were included in the study following fulfilment of the criteria. Subjects having history of Traumatic cervical lesion , Frozen Shoulder impingement syndrome, Cervical myelopathy , Shoulder injuries, Dislocation of cervical spine , Ankylosing cervical spine, Thoracic outlet syndrome, Any central nervous system pathologies and Any systemic pathologies referring pain to upper limb were excluded from the study.[8,9]

INTERVENTIONS

ULTT-2a

The test is described for the left arm.

The patient lies slightly diagonally across the bed with his head towards the left hand side of the bed. The examiner's right thing-rest on the patient left shoulder. His right hand holds the patient's elbow and his left hand holds his wrist. Using his thigh, the examiner carefully depresses the patient's shoulder girdle. The test should be performed in 10 degrees of shoulder abduction. By maintaining shoulder depression the examiner subsequently extends the patient's elbow. This Position is maintained and the examiner laterally rotates the patient's whole arm. With this position maintained, the examiner's left arm slider down. Examiner's thumb is slipped in the web between Patient's thumb and index finger. Then the examiner extends the patient's arm, finger and thumb.[10,11,12]

Figure 1: Materials used Stopwatch & Goniometer

Figure2: Upper limb tension test 2A

Figure 3: Upper limb tension test 2A with ipsilateral SLR

Figure 4: Upper limb tension test 2A with contralateral SLR

RESULTS

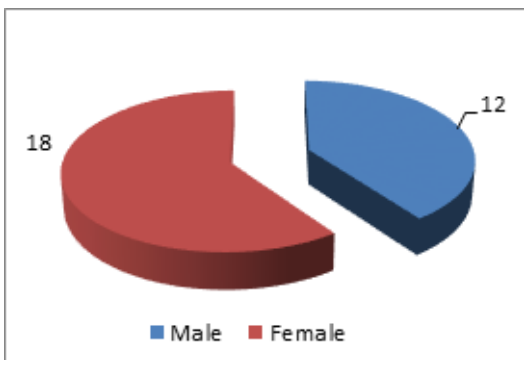
After obtaining data was analysed by paired t-test, significant difference was found in shoulder abduction ($p< 0.001$) and SLR ($p< 0.002$) but no considerable difference was found on the VAS. ($p> 0.11$). There was no difference in sensitizing response (Tingling, Burning, Sharp shooting) during ipsilateral and contra lateral straight leg raise.

Table 1- Descriptive for gender group

	Male	Female	X^2 Value	P Value
Group	18	12	1.2	0.275

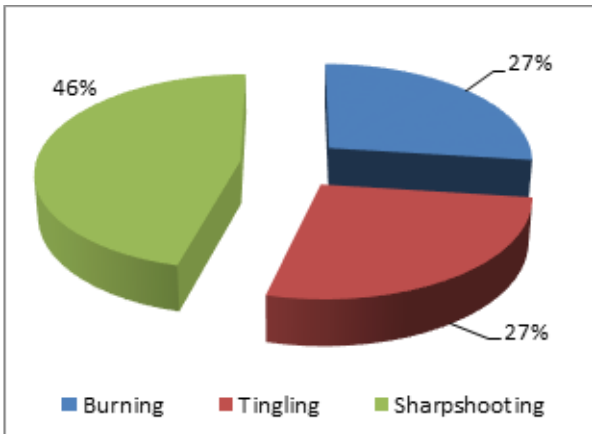
There is no significant difference in males and females

Graph 1: Descriptive for gender group



Observably, males and females are equally distributed.

Graph 2: Different sensation recorded during performing tests



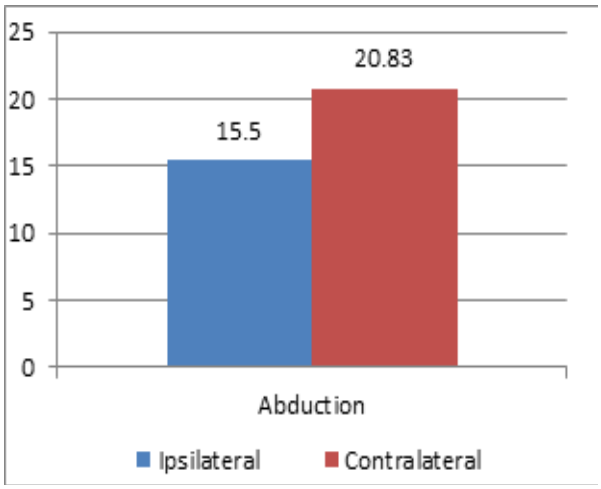
Graph shows Sharpshooting pain sensation recorded more then Tingling & Burning respectively

Table 2: Descriptive for shoulder abduction ranges with contra lateral and ipsilateral SLR

	Ipsilateral Slr	Contra-lateral Slr	P Value
Shoulder Abduction	15.5±5.14	20.83 ±4.74	0.0001

The table shows there is higher mean of shoulder abduction ranges by performing contra lateral SLR.

Graph 3: Descriptive for Shoulder abduction ranges with contra lateral and ipsilateral SLR



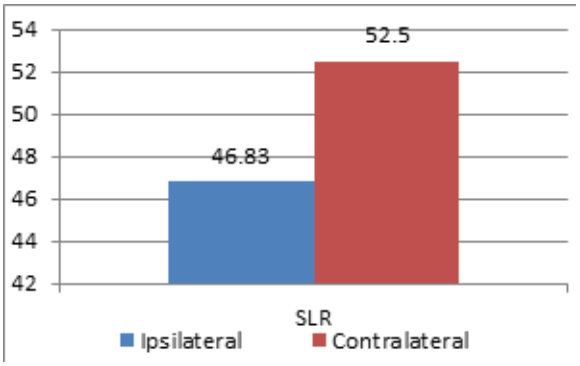
There is a higher mean on the contra lateral than on the ipsilateral SLR

Table 3: Descriptive for ipsilateral and contra lateral SLR during ULTT-2a

	Ipsilateral Slr	Contralateral Slr	P Value
SLR	46.83+6.75	52.5 +6.91	0.002

It can be observed that the mean score is higher on the ipsilateral SLR than on the contra lateral SLR.

Graph 4: Descriptive for ipsilateral and contra lateral SLR during ULTT-2a



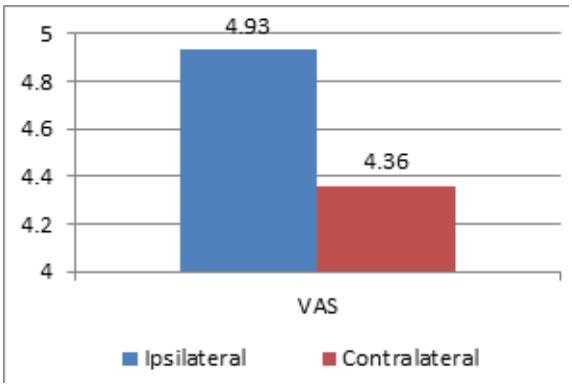
It can be observed that there is higher mean on ipsilateral SLR than on contra lateral SLR.

Table 4: Descriptive for VAS during ULTT-2a on ipsilateral and contra lateral SLR

	Ipsilateral	Contralateral	P Value
VAS	4.93±0.63	4.36±0.99	0.11

There no significant chance in the mean of VAS score on the ipsilateral SLR and contra lateral SLR.

Graph 5: Descriptive for VAS during ULTT-2a on ipsilateral and contra lateral SLR



There is no significant difference on VAS.

DISCUSSION

As nerve tension testing has been in practice by physiotherapist for many years but still very scarce literature exists on the neurodynamic of straight leg rising during upper limb tension testing. In accordance with the warren hammer study done to elicit sensitizing response in upper limb during ipsilateral SLR and as the study told contra lateral has not been focused, so there was a need for the present study.[10- 14]

These study focuses on both ipsilateral and as well as contra lateral SLR during ULLT-2a especially in cervio- brachial disorders. So hence the present study was carried out with 30 subjects on those similar lines of Jarvis study which was done to find out the relationship between upper limb disorder and lower limb neuro dynamics [15, 16, 17]. The study revealed that the abduction ROM for shoulder was greater during contra lateral SLR with ULTT-2a when compared to ipsilateral SLR, which is in contrast to study carried out by M.W. coppiters. Et.al [18].

As the research by Hall and Elvey states that proper and essential diagnosis of cervico- brachial Pain disorder by manual therapy intervention shows pain relief and restoration of function, hence the present study can also be added to the existing list for effective diagnostic aspect of neuro dynamic. So from this study the testing of contra lateral SLR along with ipsilateral SLR during ULTT-2a in cervicobrachial disorders can be carried out in future by physiotherapists for framing effective therapeutic neuro dynamics manoeuvres similar that neural mobilization is therapeutic technique that is favourable of neurogenic pain syndrome.

CONCLUSION

Thus we conclude that in order to obtain the same sensitizing response during ULTT-2a of contra-lateral SLR as during ULTT-2a of ipsilateral SLR, the angle of SLR and shoulder abduction during ULTT-2a of contra lateral SLR will be greater.

REFERENCE

[1] P. Ostergren, B. Hanson, I. Balogh. Incidence of shoulder and neck pain in a working population: effect modification between mechanical and psychosocial exposures at work? Results from a one year follow up of the Malmö shoulder and neck study cohort. J Epidemiol Community Health. 2005 Sep; 59(9): 721–728.

[2] S. Brent Brontzman, Kevin E Wilk. Clinical orthopedic rehabilitation.2nd edition; 2003.

[3] Peter L Williams. Gray's Anatomy. 38th edition; 1995.

[4] Pamela K Levangie, Cynthia C. Norkin. Joint structure and function, 4th edition; 2011.

[5] Samuel L Turek. Orthopedic principle and their application. 4th edition; 2005.

[6] David, Magee. Orthopedic Physical assessment. , 4th edition; 2007.

[7] Jarvis G. The relationship between upper limb disorders and lower limb neuro dynamics. Journal of orthopedic medicine. 1997; 19 (2):35-45

[8] Warren Hammer. Use of straight leg test for upper extremity involvement. Dynamic chriropractic. 1997; 15(24).

[9] David s. butler. Adverse Mechanical Tension in the Nervous System: A Model for Assessment and Treatment. 1989; 35 (4): 227–238.

[10] Elevy RL. Treatment of arm pain associated with abnormal brachial plexus tension. Aust J Physiother. 1986; 32(4):225-30

[11] Bell A, Dalzeiel BA, Snowill JC. The upper limb tissue tension and staright leg raising test, manipulative therapist association, proceedings, 5th biennial conference, Melbourne, 1987.

[12] Robert J, Nee, David Butler. Management of peripheral neuropathic pain: Integrating neuro biology, neurodynamics and clinical evidence, Physical therapy in sport. 2006; 7(1)110-111.

[13] Cp Coppieters MV. Bartholomleusen KE, Strappaerts KH. Incorpating nerve gliding techniques in the con-

sevative treatm-ment of tibial tunner syndromle.J.Manipulative physical therapy. 2004; 27(9), pp560-8
[14] Dimitrios Kostopoluos. Treatment of carpal tunnel syndrome; a reviw of the non-surgical approaches with emphasis in neural mobilization: Journal of Bodywork and movement therapies. 2004 ;8(1):2-8
[15] Andew Delley, Bruce Lynm, Jane Greening, Nocola Deleon, Qunatitive. In vivo studies of median nerve sliding in responses to wrist, elbow,shoulder and neck mobvements, 2003, Department of physiology, WCIE6BT, London, UK
[16] Richard A Ekstroml, Kari Holden. Examination and intervention for a patient with chronic lateral elbow pain with sings of nerve entrapment, J Physiotherapy. 2002; 82:1077-1086
[17] Garmer DA, Jenes MA, Mehode KJ, Kelly. The nerve bias upper limb neurodynamics tension test: An investigation of responses in A symptomatic subjects, Physical therapy, 2000, South West Texas State University.
[18] M.W. Coppieters, Karel H Strappaerts, Dirk and Everest Filip F States. Addition of test components during neuro dynamics testing effects on range of motion and sensory response. Journal of orthoipedic sport physiotherapy.2001;319(5):226-35.
[19] Magbagbeola JA. Pain assessment in Nigerians. Visual analogue scale and Verbal Rating scale compared. West African Journal Med. 2001; 20(3): 219-22
[20] David S. Butler. Mobilization of the nervous system. 1st edi;1991.

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