Comparative effects of muscle energy technique versus ischematic pressure on upper muscles in patients with mechanical neck pain

Dr. Amir Bux Sial [*], Dr Jeetendar Valecha [*], Dr Syed Mukhtar Ahmed [*], Dr Shamshad zahra [*], Dr Tahira Channa [*], Dr. Tasghir Nabi [*]

[*] Physiotherapist Institute of Physiotherapy & Rehabilitation Sciences Liaquat University of Medical and Health Sciences Jamshoro

Abstract-

Aim/objective: To comparative the effects of muscle energy technique versus ischemic pressure on upper muscles for pain, cervical ROM and Neck Disability Index in in patients with mechanical neck pain

Material and Methods: This comparative cross-sectional study was conducted on 30 patients in Institution of Physiotherapy and Rehabilitation Sciences Liaquat University of Medical and Health Sciences Jamshoro for six months. We included those patients with mechanical neck pain, age between 20 to 45 years having neck pain minimum duration of six weeks. Patients who had pain intensity score between 3 to 7 moderate levels, having unilateral trigger point's in upper trapezius muscles and neck pain radiating into arm and upper extremity. Those patients who had systemic and metabolic disease, fracture of cervical spine, whiplash injury and cervical spine surgery were excluded from the study

Results: A total of 30 study participants were included in this study. The mean VAS score was 7.53 ± 0.51 before the intervention (pre-test), indicating a high level of pain intensity. After the intervention, the mean VAS score decreased to 4.26 ± 0.88, indicating a significant reduction in pain intensity (P-value = <0.05). The overall results indicate that the intervention or treatment provided to the participants resulted in a significant improvement in left lateral flexion. The increase in mean score suggests that the participants were able to perform left lateral flexion with greater ease and range of motion after the intervention. The results suggest that the intervention or treatment was effective in improving left lateral flexion in the study population.

Conclusion: Study concluded that both intervention is found effective for reducing Pan and functional disability and improving in left lateral ROM further more ICE group found more effective is compared to met in patients with mechanical neck pain

Keywords: Muscle energy technique, ischematic pressure, upper muscles, mechanical neck pain

I. INTRODUCTION

Neck pain is one of the most common musculoskeletal disorders in the general population. Point prevalence ranges from 6% to 22% and up to 38% of the elderly population, while lifetime prevalence ranges from 14.2% to 71% [1]. 1The International Association for the Study of Pain defines neck pain as: "Pain perceived as arising from anywhere within the region bounded superiorly by superior nuchal line, inferior by an unoriginally transverse line through the tip of first thoracic spinous process, and laterally by sagittal plane tangential to the lateral border of neck" 2.

Mechanical neck pain is a generalized neck and/or shoulder pain with mechanical characteristics, including symptoms provoked by maintained neck postures, neck movement, or by palpation of the cervical muscles 3.The source of symptoms in mechanical neck pain is not completely understood, but has been purported to be related to various anatomical structures, particularly zygapophyseal or uncovertebral joints of the cervical spine 4. A frequently seen cause of the neck pain is awkward occupational postures, anxiety, stress, heavy lifting, and physically demanding work 5.

Janda et al. described upper crossed syndrome as facilitation of the upper trapezius, levator scapulae, sternocleidomastoid, and pectoralis muscles, as well as inhibition of the deep cervical flexors, lower trapezius, and serratus anterior.6 These muscle imbalances and movement dysfunctions may have a direct effect on joint surfaces, thus potentially leading to joint degeneration. In some cases, joint degeneration may be a direct source of pain, but the actual cause of pain has been often secondary to muscle imbalance 7.

A wide variety of treatment protocols for mechanical neck pain are available. However, the most effective management remains an area of debate.

Musculoskeletal disorders represented a significant cost to the health care system. Obesity, sedentary lifestyle and aging are the main risk factors which increases the prevalence of musculoskeletal problems.8

Neck pain is a common musculoskeletal syndrome among both genders. Physical therapist used number of treatment to manage the mechanical neck pain like mobilization, manipulation, massage, electrotherapy and others therapeutic exercises.9

Decrease in stress level, body mechanics and training and counselling about ergonomic, nutrition and pharmacological management may also help to manage mechanical neck pan.10

The prevalence of neck pain varies widely between studies, with a mean point prevalence of 7.6% (range 5.9 – 38.7) and mean lifetime prevalence of 50% (range 14.2 – 71.0).2 Nonspecific

neck pain is sometimes called 'simple' or 'mechanical' neck pain. Mechanical neck pain affects 45–54% of the general population at some time during their lives and can result in severe disability.3 The exact pathology of mechanical neck pain is not clearly understood. Different authors often assume that mechanical neck pain is associated with muscular, joint and neural impairment. 11

Both muscle energy technique (MET) and stretching are widely used techniques in the field of physiotherapy. MET is an advanced stretching techniques7. Studies using these two techniques individually in symptomatic as well as in asymptomatic population have shown improvement 12 , but very few studies have compared these techniques in a symptomatic population, where conflicting results are seen 13. A study done by Mahajan et al compared these two treatment technique in patients with mechanical neck pain.14 There is lack of evidence to allow conclusions to be drawn about the effectiveness of MET when compared with stretching exercises for relieving mechanical neck pain.

This study will be helpful in improving patient outcome along with Functional Disabilities, Range of Motion and associated pain. This study definitely creates a foreground for future studies and ultimately reducing the severity of symptoms of mechanical neck pain, would helpful in improving the quality of disablement along with quality of practice and expertise of physical intervention/ therapies. Therefore, this study will add to the growing body of knowledge that if these two techniques yield a comparable outcome and if one technique is superior to the other, which should be an alternative choice of therapy in improving ROM in patients suffering from Mechanical Neck Pain.

.

RATIONAL OF THE STUDY

Mechanical neck pain is the prevalent and important clinical condition affecting the daily life of middle and older aged population. So determining this condition there are less evidences which focuses on the comparative effect of Muscle Energy Technique v/s Ischemic pressure reducing pain, cervical ROM and Neck Disability Index in subjects with mechanical neck pain.

II. MATERIAL AND METHODS

This comparative cross-sectional study was conducted on 30 patients in Institution of Physiotherapy and Rehabilitation Sciences Liaquat University of Medical and Health Sciences Jamshoro for six months. We included those patients with mechanical neck pain, age between 20 to 45 years having neck pain minimum duration of six weeks. Patients who had pain intensity score between 3 to 7 moderate levels, having unilateral trigger point's in upper trapezius muscles and neck pain radiating into arm and upper extremity. Those patients who had systemic and metabolic disease, fracture of cervical spine, whiplash injury and cervical spine surgery were excluded from the study.

Assessment procure

The participant was divided into two groups A and B and NDI Pan intensity and ROM of each group was checked before and after intervention

Muscles energy technique

Group-A; (n15) Patient receives 6 treatment session of METs for upper trapezius muscles (3 times a week) for 2 weeks and 6 sessions of cold take for 10 minutes

Upper trapezius

To treat upper trapezius muscles, ask the patience to either side band the cervical spine to the right or elevate the right shoulder against the residence and hold it for 10 seconds then ask the passion to relax and take the breath than applies same action on left side.

Ischemic compression

Group divas treated with s a k Mac compression after locating the active trigger points patient work placed supine on the coach with his head fully on the surface of the coach arm was positioned in slide shoulder abduction elbow bended with their hand resting on their stomach.15

Applied through algometry directly on the trigger points to create tolerable painful pressure applied at the rate of 1 kg cm2 s until the moment that the pressure was perceived as pressure and pain(hold this technique for approximately 20 second to 1 minute) and record date the reading shown on algometry three constructive reading will be taken and then calculate mean for further analysis after pretreatment data second application of pressure of 2.5 kg cm2 will be applied and told the subject to mark his pen intensity on v a s the v a s was used to measure local pain revoked by application of 2.5 kg cm to 0 Telugu battery the maximum treatment time was 5 minute.16

Ethical consideration

The data was kept confidential and followed by serial numbering and coding the informed consent firm was signed by participants

III. RESULTS

A total of 30 study participants were included in this study based on inclusion and exclusion criteria.

The mean VAS score was 7.53 ± 0.51 before the intervention (pre-test), indicating a high level of pain intensity. After the intervention, the mean VAS score decreased to 4.26 ± 0.88, indicating a significant reduction in pain intensity.

The P-value in the table is less than 0.05, indicating that the reduction in pain intensity from pre-test to post-test was statistically significant. This suggests that the intervention was effective in reducing pain intensity in this group of participants with IC.

Overall, the data table suggests that the intervention was effective in reducing pain intensity in participants with IC, as indicated by the significant reduction in mean VAS scores from pre-test to post-test**. Table 1**

The mean score for the pre-test was 34.2 ± 3.93, indicating the initial level of the participants' performance. After the intervention, the mean score for the post-test was 23.2667 ± 4.36, which is significantly lower than the pre-test score (P-value < 0.05). This suggests that the intervention was effective in improving the participants' performance.

The P-value indicates the level of significance of the difference between the pre-test and post-test scores. A P-value less than 0.05 suggests that the difference is statistically significant, meaning that it is unlikely to have occurred by chance alone. This provides evidence that the intervention had a meaningful impact on the participants' performance.

In summary, the data table suggests that the intervention (NDI) was effective in improving the participants' performance, as evidenced by the statistically significant difference between the pre-test and post-test scores. **Table 1**

The pre-test mean left lateral flexion measurement was 27.73 degrees, with a standard deviation of 5.52 degrees. After the intervention, the post-test mean measurement increased to 36.68 degrees, with a standard deviation of 6.15 degrees.

The P-value, which is a statistical measure of the significance of the results, is less than 0.05. This means that there is a statistically significant difference between the pre-test and post-test measurements, indicating that the intervention had a positive effect on left lateral flexion.

The data table suggests that the intervention had a beneficial effect on left lateral flexion of the spine, as evidenced by the significant increase in post-test measurements compared to pre-test measurements. **Table 1**

In this case, the mean VAS score before the intervention was 5.13 ± 0.21, indicating a moderate level of pain. After the intervention, the mean VAS score decreased significantly to 1.87 ± 0.35, suggesting a substantial reduction in pain.

The p-value reported as "< 0.05" suggests that the difference in mean scores between the pre-test and post-test is statistically significant. Specifically, it indicates that the likelihood of observing such a large difference in mean scores by chance is less than 5%, which is generally considered significant in statistical analyses.

In summary, the data provided suggests that the intervention was effective in reducing pain in the study population, as evidenced by a significant difference in mean VAS scores before and after the intervention. **Table 1**

The data shows the results of a pre-test and post-test study using the NDI (MET) assessment tool. The mean score for the pre-test was 20.26 with a standard deviation of 1.47. The mean score for the post-test was 5.8 with a standard deviation of 2.06. The p-value for the study was less than 0.05, indicating that there was a statistically significant difference between the pre-test and post-test scores. **Table 1**

This suggests that the intervention being tested had a positive impact on the participants' NDI (MET) scores. The NDI (MET) assessment tool is commonly used to measure functional disability in patients with neck pain, so the results of this study may indicate an improvement in the participants' ability to perform daily activities without pain or discomfort. **Table 1**

The data presented in the table show the results of a pre- and post-test measuring left lateral flexion (MET) in a group of individuals. The mean score for left lateral flexion in the pre-test was 35.66±1.18, while in the post-test, the mean score increased to 41.53±0.49. The difference between the pre- and post-test means was found to be statistically significant (P<0.05).

This indicates that the intervention or treatment provided to the participants resulted in a significant improvement in left lateral flexion. The increase in mean score suggests that the participants were able to perform left lateral flexion with greater ease and range of motion after the intervention. The results suggest that the intervention or treatment was effective in improving left lateral flexion in the study population. **Table 1**

Mean ± SD	Pre-test	Post-test	P-value
VAS (IC)	7.53±0.51	4.26± 0.88	< 0.05
NDI (ICI)	34.2± 3.93	23.26± 4.36	< 0.05
Left lateral flexion	27.73±5.52	36.68±6.15	< 0.05
VAS (MET)	5.13±0.21	1.87±0.35	< 0.05
NDI (MET)	20.26±1.47	5.8±2.06	< 0.05
Left Lateral Flexion (MET)	35.66±1.18	41.53±0.49	< 0.05

IV. DISCUSSION

Present study short significant improvement in both IC and MET Group for reducing pain and disability and increases left lateral flexion ROM. Furthermore, IC group found more effective is compared to MET in patients with mechanical neck pain.

Study reported both techniques Ischemic compression and MET effective for reducing pain and NDI scores and improving left lateral room for the treatment of upper trapezius trigger points moreover study found MET more effective than other intervention.[17]

A study reported meaningful positive outcome in a both intervention but I see chemic compression found more effective for reducing disability and ROM while reduction in pen was observed in m80 group in upper trapezius my official trigger points.[18].

V. CONCLUSION

Study concluded that both intervention are found effective for reducing Pan and functional disability and improving in left lateral ROM further more ICE group found more effective is compared to MET in patients with mechanical neck pain

REFERENCES

Fejer R, Kyvik KO, Hartvigsen J. The prevalence of neck pain in the world population: a systematic critical review of the literature. Eur Spine J [Internet]. 2006 Jun 6;15(6):834–48. Available from: http://link.springer.com/10.1007/s00586-004-0864-4

Misailidou V, Malliou P, Beneka A, Karagiannidis A, Godolias G. Assessment of patients with neck pain: a review of definitions, selection criteria, and measurement tools. J Chiropr Med [Internet]. 2010 Jun;9(2):49–59. Available from:https://linkinghub.elsevier.com/retrieve/pii/S1556370710000350

Fernández-de-las-Peñas C, Palomeque-del-Cerro L, Rodríguez-Blanco C, Gómez-Conesa A, Miangolarra-Page JC. Changes in Neck Pain and Active Range of Motion After a Single Thoracic Spine Manipulation in Subjects Presenting with Mechanical Neck Pain: A Case Series. J Manipulative Physiol Ther [Internet]. 2007 May;30(4):312–20. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0161475407000796

Kanlayanaphotporn R, Chiradejnant A, Vachalathiti R. The Immediate Effects of Mobilization Technique on Pain and Range of Motion in Patients Presenting With Unilateral Neck Pain: A Randomized Controlled Trial. Arch Phys Med Rehabil [Internet]. 2009 Feb;90(2):187–92. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0003999308015840

Bovim G, Schrader H, Sand T. Neck pain in the general population. Spine (Phila Pa 1976) [Internet]. 1994 Jun;19(12):1307–9. Available from: http://journals.lww.com/00007632-199406000-00001

Janda V. Muscles and motor control in cervicogenic disorders: assessment and management. Phys Ther Cerv Thorac spine. 1994;

Chaitow L, Crenshaw K. Muscle energy techniques. Elsevier Health Sciences; 2006.

Law D, McDonough S, Bleakley C, Baxter GD, Tumilty S. Laser Acupuncture for Treating Musculoskeletal Pain: A Systematic Review with Meta-analysis. J Acupunct Meridian Stud. 2015 Feb;8(1):2–16.

Llamas-Ramos R, Pecos-Martín D, Gallego-Izquierdo T, Llamas-Ramos I, Plaza-Manzano G, Ortega-Santiago R, et al. Comparison of the Short-Term Outcomes Between Trigger Point Dry Needling and Trigger Point Manual Therapy for the Management of Chronic Mechanical Neck Pain: A Randomized Clinical Trial. J Orthop Sport Phys Ther. 2014 Nov;44(11):852–61.

Kannan P. Management of Myofascial Pain of Upper Trapezius: A Three Group Comparison Study. Glob J Health Sci. 2012 Jul;4(5).

Shah N, Shah N. Comparison of two treatment techniques : muscle energy technique and ischemic compression on upper trapezius trigger point in subjects with non specific neck pain. Int J Ther Rehabil Res [Internet]. 2015;4(5):260. Available from: http://www.scopemed.org/fulltextpdf.php?mno=199557

Narain A, Singh J, Bhowmik S. To compare the effect of core stability exercises and muscle energy techniques on low back pain patients. IOSR J Sport Phys Educ. 2013;1(2):9–15.

Ahmed ET, Abdelkarim SS. Efficacy of muscle energy technique versus static stretching technique in increasing hamstring flexibility post burn contracture. Int J Heal Rehabil Sci. 2013;2(1):22–7.

Mahajan R, Kataria C, Bansal K. Comparative effectiveness of muscle energy technique and static stretching for treatment of subacute mechanical neck pain. Int J Heal Rehabil Sci. 2012;1(1):16–21.

Nambi G, Sharma R, Inbasekaran D, Vaghesiya A, Bhatt U. Difference in effect between ischemic compression and

muscle energy technique on upper trepezius myofascial trigger points: Comparative study. Int J Heal Allied Sci. 2013;2(1):17.

Fernández-De-Las-Peñas C, Alonso-Blanco C, Fernández-Carnero J, Carlos Miangolarra-Page J. The immediate effect of ischemic compression technique and transverse friction massage on tenderness of active and latent myofascial trigger points: A pilot study. J Bodyw Mov Ther. 2006 Jan;10(1):3–9.

Yatheendra Kumar G, Sneha P, Sivajyothi N. Effectiveness of Muscle energy technique, Ischaemic compression and Strain counterstrain on Upper Trapezius Trigger Points: A comparative study. Int J Phys Educ Sport Heal IJPESH. 2015;1(13):22–6.

Gilani MHZ, Obaid S, Tariq M. Comparison between Effectiveness of Ischemic Compression and Muscle Energy Technique in Upper Trapezius Myofascial Trigger Points. ISRA Med J. 2018;10(4):1–6. 88.

AUTHORS

First Author – Amir Bux Sial
DPT, M.Phil., Physiotherapist Institute of Physiotherapy & Rehabilitation Sciences LUMHS Jamshoro

Second Author – Jeetendar Valecha
BSPT, MSc. (Musculoskeletal), Post Professional DPT,
PhD Scholar Rehabilitation & Physiotherapy Manager
IPRS OPD Institute of physiotherapy and Rehabilitation Science LUMHS Jamshoro

Third Author – Syed Mukhtar Ahmed
DPT, M.Phil., CRCP Physiotherapist Institute & Department: IPRS LUMHS JAMSHORO

Fourth Author Shamshad Zahra
BSPT, TDPT Physiotherapist Institute & Department: IPRS LUMHS JAMSHORO

Fifth Author - Tahira Channa
BSPT, PPDPT Physiotherapist Institution & Deportment IPRS LUMHS JAMSHORO

Sixth Author – Tasghir Nabi
MSc PT(Musculoskeletal), BSPT Physiotherapist/ Clinical coordinator
Institute & Department IPRS LUMHS JAMSHORO

Seventh Author-Dr Ravina Kumari
Postgraduate Trainee Operative Dentistry
Institute of Dentistry LUMHS Jamshoro

Correspondence Author – Jeetendar Valecha
BSPT, MSc. (Musculoskeletal), Post Professional DPT,
PhD Scholar Rehabilitation & Physiotherapy Manager
IPRS OPD Institute of physiotherapy and Rehabilitation Science LUMHS Jamshoro