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Comparative study of static stretching v/s muscle energy technique in lavator scapula syndrome

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Abstract
Background: Levator Scapulae Syndrome, often characterized by pain at the upper medial angle of the scapula, is frequently caused by overuse and the development of Myofascial Trigger Points (MTrPs). The prevalence of active MTrPs in this muscle among patients with neck pain is approximately 82.14%.
Objective: To compare the effectiveness of Static Stretching versus Muscle Energy Technique (MET), both combined with Ultrasound, on pain and cervical range of motion (ROM).
Methodology: An observational study was conducted involving 30 participants (aged 18–25) with mechanical neck pain and a positive "jump sign". Participants were divided into Group A (Static Stretching + Ultrasound) and Group B (MET + Ultrasound).
Results: Based on the review of literature within the sources, MET has been shown to significantly increase cervical ROM in all planes, while ultrasound therapy effectively reduces pain as measured by the Visual Analog Scale (VAS).
Conclusion: Both interventions are clinically supported, with MET providing specialized neuromuscular benefits through post-isometric relaxation.

Keywords: Levator Scapulae Syndrome, Muscle Energy Technique, Static Stretching, Ultrasound, Myofascial Trigger Points, Mechanical Neck Pain.

Introduction

Levator Scapulae Syndrome is the historical name for "pain over the upper medial angle of the scapulae"[1], It is typically caused by overuse of levator scapulae either from sports or from repetitive motion during daily activities. Symptoms [2] include:

- Pain which may extend to the head causing headache
- Restricted ROM especially reduced cervical flexion and side flexion to the contralateral side
- Deep achy tightness and pain on upper back along the top of the shoulder blade or neck
- Increased muscle tone and trigger points

The prevalence of MPS among non-specific neck pain in patients was 100%. The prevalent active Myofacial Trigger Points (MTrPs) in Levator scapulae muscle is 82.14%. [3]

Levator scapulae muscle is a band like muscle which originates on the transverse processes of the vertebrae C1-C4 And inserts on the superior angle of the scapula. It runs along the lateral posterior sides of the neck. The inferior portion is normally deep to and covered by the trapezius. The superior portion becomes superficial. It influences both neck motion and upper back posture [4]

Levator comes from a Latin word "levare" meaning to "lift" and "Scapulae" refers to the scapula bone itself. Therefore this is a muscle that lifts or elevates the scapulae* The tender point is located at the superomedial border of scapulae and nape of neck. Referred pain is felt in posterior neck through the shoulder with pain radiating in occiput.

The, lower trigger point lies just above the superior angle of the scapula and upper trigger point lies 1-3 inches above the lower trigger point. Both trigger points lie deep to the upper trapezius muscles

Trigger points are defined as hypersensitive and hyperirritable spot in a taut band of a skeletal muscle that are painful on contraction, stretching or stimulation and give rise to referred distant pain. There are two types of trigger points, Active trigger point reproduces symptoms like neck pain, shoulder pain, and headache spontaneously or in response to a movement wherens a latent trigger is a sensitive spot that causes pain or discomfort only in response to compression)

The pathophysiology of MTrPs result from injured or overstressed muscle fibre. leading to involuntary shortening and loss of oxygen and nutrient supply, with increased metabolic demand on local tissues!?

Myofascial pain is common amongst most individuals, but poorly recognized and inadequately managed. Symptoms cause severe discomfort and inability to work, The causes of myofascial pain are structural inadequacies, tight constrictive clothing, systemic, alcohol. inflammation. Trigger points are common in 5

Most muscles like trapezius, levator scapulae. rhomboid. Trigger points cause local and referred soft tissue pain. This can turn out to be worse if the person slouches, or does not have a proper Lumbar support

MET (Muscle Energy Techniques) are a class of soft tissue osteopathic (originally) manipulation methods that incorporate precisely directed and controlled, patient initiated, isometric and/or isotonic contractions, designed to improve musculoskeletal function and reduce pain!°]

For the purpose of this study, an isometric muscle contraction was utilized for the following reasons (a) shortened and hypertonic muscles are a major component of restricted motion. (b) After an isometric contraction a hypertonic muscle can be passively stretched to a new resting length due to the effect of neural input on gamma control to the fusiform motor mechanism.

(c) The muscle contraction stimulates firing of golgi tendon organ causing musele fibres to relax and lengthen [12]

Stretching is a general term used to describe any therapeutic maneuver designed to increase mobility of soft tissues and

subsequently improve ROM by elongating (lengthening) structures that have adaptively shortened and have become hypomobile over time. When a muscle is stretched and elongated, the stretch force is transmitted to the muscle fibers via the connective tissue (endomysium and perimysium) in and around the fibers. During passive stretch, both longitudinal and lateral force transduction occurs. When initial lengthening occurs in the series elastic (connective tissue) component, tension rises sharply. After a point there is a mechanical disruption (influenced by neural and biochemical changes) of the cross bridges as the filaments slide apart, leading to an abrupt lengthening of the sarcomeres, known as Sarcomere give. When the stretch force is released, the individual sarcomeres return to their resting length. If more permanent length increases are to occur, the stretch force must be maintained over an extended period of time.

Static stretching is used to describe a method by which soft tissue are lengthened just past the point of tissue resistance and then held in the lengthened position for an extended period of time with sustained stretch force. In the research literature,"static stetching" has been linked to durations ranging from a few as 15sec to several minutes when a manual stretch or self stretching procedure is employed

Ultrasound is a frequently used physical agent in soft tissue lesions, which increases blood flow in tissues with its thermal effect, permeability in membranes, and tissue healing. It also reduces muscle spasms and increases the ability of collagen fibers to grow.

MethodologyStudy Design: This is an observational study conducted in Pune with 30 participants selected via random sampling.

Selection Criteria: Participants aged 18–25 with mechanical neck pain, a positive "jump sign," and a VAS score > 4 were included. Exclusion criteria included cervical fractures, recent surgery, or systemic disorders.

Procedures

- **Group A (Static Stretching + Ultrasound):** Ultrasound was applied for 5 minutes at 1MHz. For the stretch, the patient sat and leaned away from the affected side; the therapist rotated the head 45 degrees and gently pulled toward the knee, holding for 15–30 seconds for 3 repetitions.

- **Group B (MET + Ultrasound):** Ultrasound was applied identically to Group A. The patient lay supine while the therapist moved the neck into full flexion and rotation. The patient performed a 7–10 second isometric contraction (20% strength) against resistance, followed by relaxation and movement to a new resistance barrier.

- **Outcome Measures:** Data was collected using the Visual Analogue Scale (VAS) and a goniometer for cervical range of motion.

Results and Discussion

Note: The results are synthesized from the academic literature provided in the sources' "Review of Literature" section.

Statistical Evaluation of Literature Findings: According to the sources, the following outcomes represent the expected statistical trends for this study:

- **Range of Motion (ROM):** A study by Ronald Schenk *et al*. (2013) demonstrated that MET significantly increases cervical flexion, extension, side-bending, and rotation.

- **Pain Reduction:** Mustafa Aziz Yildirim *et al*. (2018) reported that 10 sessions of conventional ultrasound therapy are effective for myofascial pain syndrome, showing significant improvements in VAS scores and palpable muscle spasm degrees.

- **Comparative Efficacy:** Research by Krupa D. Tank *et al*. (2017) concluded that MET and Mulligan Snags are equally effective in reducing pain and disability while increasing ROM.

Discussion: The data highlights that Levator Scapulae Syndrome is often unrecognized due to a lack of clinical awareness. The physiological benefit of MET is attributed to its ability to stimulate the Golgi tendon organ, causing the muscle fibers to relax and lengthen, which is particularly effective for hypertonic muscles. Static stretching, while effective, relies more on the mechanical disruption of sarcomere cross-bridges. Based on the literature by Hye Mi Jeong *et al*. (2017), both passive stretching and MET are effective methods for improving ROM and pressure pain thresholds in young adults.

1. Statistical Framework (Planned)

The study is designed as an **observational study** with a sample size of **30 participants** divided into two groups. To perform a statistical evaluation as requested, the following parameters would be measured using the "Data Collection Form" provided in the annexure:

- **Variables for Evaluation**
- **Pain:** Measured via the Visual Analogue Scale (VAS).

- **Range of Motion (ROM):** Measured via a **Goniometer** for cervical flexion, extension, lateral flexion, and rotation.

- **Parametric Test Suitability:** Since the study compares two groups (Group A: Static Stretching + US and Group B: MET + US), a typical parametric evaluation would involve:

- **Paired t-test:** To compare pre-treatment and post-treatment results within each group.

- **Unpaired (Independent) t-test:** To compare the final outcomes between Group A and Group B to determine which intervention was more effective.

2. Trends from Supporting Literature

While the charts for this specific study cannot be generated without the data, the Review of Literature in the sources provides the following statistical trends that are usually represented in such graphs:

Range of Motion (ROM) Increases: A study by Schenk *et al*. (2013) reported that a four-week treatment of Muscle Energy Technique (MET) led to a significant increase in cervical flexion, extension, side-bending, and rotation.

- **Pain Reduction:** Yildirim *et al*. (2018) utilized a randomized, single-blind study to show that Ultrasound therapy is statistically effective in reducing pain in Myofascial Pain Syndrome, as measured by VAS and algometry.

- **Comparative Efficacy:** Research by Tank *et al*. (2017) concluded that MET and Mulligan Snags are equally effective in improving ROM and reducing functional disability.

3. Summary of Data Collection Parameters

According to the Annexure-2 Data Collection Form, the results would be structured as follows for statistical plotting:

Parameter	Pre-Intervention (Mean ± SD)	Post-Intervention (Mean ± SD)	p-value (Significance)
VAS Score	Expected 4	Expected Reduction	(Target)
Cervical Flexion	Baseline Degrees	Increased Degrees	(Target)
Cervical Rotation	Baseline Degrees	Increased Degrees	(Target)

Note on Information outside of sources

To provide actual charts and graphs, specific numerical values for the 30 participants would be required. Since the Annexure-2 Data Collection Form in your sources is currently blank, these values have not yet been recorded. If you have the raw numerical data from your clinical trials, please provide it, and I can then assist in creating the specific statistical visualizations you need.

Conclusio

The sources conclude that Levator Scapulae Syndrome is a significant cause of mechanical neck pain and restricted mobility, with a high prevalence of active trigger points. Both Static Stretching and Muscle Energy Technique, when combined with the thermal benefits of Ultrasound, are supported by literature as effective treatments. While stretching provides mechanical elongation, MET offers a sophisticated neuromuscular approach to restoring muscle length and reducing pain, making both techniques essential for musculoskeletal rehabilitation.

References

1. Menachem A, Kaplan O, Deket S. Levator scapula syndrome: an anatomic-clinical study. Bull Hosp Joint Dis,1991:53(1):21-4.
2. Fernández-de-las-Peñas C, Alonso-Blanco C, Miangolarra JC. Myofascial trigger points in subjects presenting with mechanical neck pain: A blinded, controlled study. Manual Therapy,2007:12(1):29-33.
3. Estwanik J. Levator Scapulae Syndrome. The Physician and Sportsmedicine,1989:17(10):57-68. Additional mention: Harmon Myers DO, Julia Jernberg MD. Strain and Counterstrain. pp. 1-11.
4. Yoganatomy. Levator Scapulae Muscle. Available at: https://www.yoganatomy.com/levator-scapulae-muscle/.
5. Physiopedia. Levator Scapulae Syndrome. Available at: https://www.physio-pedia.com/Levator_Scapulae_Syndrome.
6. Fernandez-de-las-Peñas C, Grübli C, Ortega-Santiago R, *et al*. Referred Pain From Myofascial Trigger Points in Head, Neck, Shoulder, and Arm Muscles Reproduces Pain Symptoms in Blue-collar (Manual) and White-collar (Office) Workers. The Clinical Journal of Pain,2012:28(6):511-518.
7. PubMed. Pathophysiology of myofascial trigger point. J Formos Med Assoc,1996:95(2):93-104.
8. Kannan P. Management of Myofascial Pain of Upper Trapezius: A Three Group Comparison Study. Global Journal of Health Science, 2012, 4(5).
9. Leon Chaitow. Muscle Energy Techniques. 3rd Edition, pages 1-3.
10. Carolyn Kisner, Lynn Allen Colby. Therapeutic Exercise: Foundation and Technique. 4th Edition.
11. Yildirim MA, Öneş K, Gökşenoğlu G. Effectiveness of Ultrasound Therapy on Myofascial Pain Syndrome of the Upper Trapezius: Randomized, Single-Blind, Placebo-Controlled Study.
12. Ronald Schenk, Kimberly Adelman, John Rousselle. The Effects of Muscle Energy Technique on Cervical Range of Motion. Journal of Manual & Manipulative Therapy, 2013, 2.
13. Yildirim MA, Öneş K, Gökşenoğlu G. Effectiveness of Ultrasound Therapy on Myofascial Pain Syndrome of the Upper Trapezius: Randomized, Single-Blind, Placebo-Controlled Study. Arch Rheumatol,2018:33(4):418-423.