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"An Effectiveness Of Myokinetic Stretching Technique V/S Integrated Neuromuscular Inhibition Technique On Pain, Range Of Motion And Disability In Chronic Mechanical Neck Pain: A Comparative Study"

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Abstract

Chronic mechanical neck pain is a common musculoskeletal disorder that adversely affects daily activities, occupational performance, and quality of life. It is frequently associated with myofascial trigger points, muscle tightness, reduced cervical range of motion, and functional disability. Among the various physiotherapy interventions used for its management, Myokinetic Stretching Technique (MST) and Integrated Neuromuscular Inhibition Technique (INIT) are commonly employed manual therapy approaches. However, limited evidence is available regarding their comparative effectiveness in individuals with chronic mechanical neck pain. The present study aimed to compare the effects of MST and INIT on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain. A total of 76 subjects were included and allocated into two groups of 38 each. Group A received MST along with conventional exercises, whereas Group B received INIT along with conventional exercises. Both groups were treated three times per week for two weeks. Outcome measures included the Visual Analog Scale (VAS), Neck Disability Index (NDI), and Active Cervical Range of Motion (ACROM). The findings demonstrated significant improvement within both groups in pain, disability, and cervical range of motion. Between-group analysis revealed significant differences in disability and cervical range of motion in favor of the INIT group, while pain reduction was not significantly different between groups. The study concludes that both MST and INIT are effective in the management of chronic mechanical neck pain; however, INIT appears to be more effective in improving disability and cervical mobility.

Keywords: Chronic mechanical neck pain, Myokinetic Stretching Technique, Integrated Neuromuscular Inhibition Technique, pain, disability, cervical range of motion, physiotherapy.

I. Introduction

Neck pain is among the most prevalent musculoskeletal complaints and represents a major cause of functional limitation and disability in the adult population [4,5]. Mechanical neck pain commonly arises from cervical muscles, ligaments, joints, fascia, and related soft tissues in the absence of serious pathology. When symptoms persist for an extended period, the condition is classified as chronic mechanical neck pain. This disorder is frequently associated with restricted cervical mobility, muscular tightness, postural dysfunction, tenderness, and disability, all of which can interfere with daily activities and work efficiency [3,4].

The growing prevalence of sedentary occupations, prolonged computer use, poor ergonomics, and sustained faulty posture has contributed to the increasing incidence of chronic neck pain. In clinical practice, chronic mechanical neck pain is often associated with myofascial trigger points, particularly in the upper trapezius and levator scapulae muscles [3,5]. These trigger points may contribute to local pain, stiffness, limited movement, and decreased functional capacity.

Physiotherapy plays a central role in the conservative management of chronic mechanical neck pain. Common interventions include manual therapy, stretching, strengthening exercises, posture correction, muscle energy techniques, and trigger-point release [4,5]. Among these, Myokinetic Stretching Technique and Integrated Neuromuscular Inhibition Technique are widely used approaches.

Myokinetic Stretching Technique is intended to improve muscle extensibility, reduce soft-tissue tightness, and restore normal movement patterns through controlled stretching principles [1,2]. Integrated Neuromuscular Inhibition Technique is a combined manual therapy approach consisting of ischemic compression, strain-counterstrain, and muscle energy technique. It is designed to reduce trigger-point sensitivity, improve muscle relaxation, and enhance mobility [3,4].

Although both MST and INIT are used in physiotherapy management, limited literature is available comparing their relative effectiveness in patients with chronic mechanical neck pain. Therefore, this study was undertaken to compare the effectiveness of MST and INIT on pain, cervical range of motion, and disability in individuals with chronic mechanical neck pain.

II. Need of the Study

Chronic mechanical neck pain is frequently encountered in physiotherapy practice and is often associated with pain, stiffness, reduced cervical mobility, and functional disability. Manual therapy techniques are commonly prescribed to address these impairments, yet the choice of the most effective intervention remains clinically significant. While both MST and INIT have demonstrated beneficial effects individually, direct comparative evidence between these two techniques in chronic mechanical neck pain is limited. Identifying the more effective intervention may help physiotherapists select an evidence-based treatment approach and improve rehabilitation outcomes in this patient population.

III. Aim of the Study

To compare the effectiveness of Myokinetic Stretching Technique versus Integrated Neuromuscular Inhibition Technique on pain, range of motion, and disability in subjects with chronic mechanical neck pain.

IV. Objectives of the Study

1. To determine the effect of Myokinetic Stretching Technique on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.
2. To determine the effect of Integrated Neuromuscular Inhibition Technique on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.
3. To compare the effects of Myokinetic Stretching Technique and Integrated Neuromuscular Inhibition Technique on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.

V. Hypotheses

Null Hypothesis

There will be no significant effect of Myokinetic Stretching Technique on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.
There will be no significant effect of Integrated Neuromuscular Inhibition Technique on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.
There will be no significant difference between Myokinetic Stretching Technique and Integrated Neuromuscular Inhibition Technique in improving pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.

Alternative Hypothesis

There will be a significant effect of Myokinetic Stretching Technique on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.
There will be a significant effect of Integrated Neuromuscular Inhibition Technique on pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.
There will be a significant difference between Myokinetic Stretching Technique and Integrated Neuromuscular Inhibition Technique in improving pain, cervical range of motion, and disability in subjects with chronic mechanical neck pain.

VI. Review of Literature

Existing literature suggests that manual therapy and stretching-based interventions are beneficial in the management of mechanical neck pain. Previous studies have shown that myofascial release, stretching, trigger-point management, and muscle energy techniques can reduce pain and improve range of motion and function.

Myokinetic Stretching Technique has been reported to improve muscle flexibility, reduce soft-tissue tightness, and facilitate normal movement. It has been used in musculoskeletal conditions involving restricted mobility and muscular dysfunction. Similarly, Integrated Neuromuscular Inhibition Technique has demonstrated effectiveness in reducing trigger-point sensitivity, decreasing muscle spasm, improving circulation, and restoring muscle function. Since INIT combines ischemic compression, strain-counterstrain, and muscle energy technique, it may provide a broader therapeutic effect than a single manual therapy approach alone.

Despite these reported benefits, limited comparative evidence is available regarding the relative effectiveness of MST and INIT in chronic mechanical neck pain. This gap in evidence provided the basis for the present comparative study.

VII. Materials and Methodology

Study Design

This study was an experimental comparative study.

Study Setting

The study was conducted in the Physiotherapy Department of Shree Sardar Smarak Hospital, Shrimad Rajchandra College of Physiotherapy, and Diwaliben Trust Physiotherapy OPD, Bardoli.

Sample Size

The sample size was calculated using G*Power software. The required sample size was 70. Considering possible dropouts, the final sample size was increased to 76.

Sampling Method

Convenient sampling was adopted.

Participants

A total of 76 subjects with chronic mechanical neck pain were included in the study and divided equally into two groups, with 38 subjects in each group.

Inclusion Criteria

- Age between 18 and 45 years
- Male and female subjects
- Duration of neck pain of at least 6 weeks
- Pain intensity between 3 and 8 on the Visual Analog Scale
- Presence of myofascial trigger point in the upper trapezius on the painful side
- Willingness to participate in the study

Exclusion Criteria

- History of cervical trauma, fracture, or surgery
- Rheumatic or inflammatory disorders
- Neurological involvement
- Radiating pain into the upper limb
- Severe cervical pathology
- Any condition that could interfere with treatment participation

Outcome Measures

1. **Visual Analog Scale (VAS):** Used to assess pain intensity [9,10].
2. **Neck Disability Index (NDI):** Used to assess functional disability [7,9].
3. **Active Cervical Range of Motion (ACROM):** Used to assess cervical mobility [8].

Procedure

Ethical approval was obtained prior to the commencement of the study. Participants who fulfilled the inclusion criteria were informed about the study procedure, and written consent was obtained. Baseline assessment was carried out for pain, disability, and active cervical range of motion.

The participants were then allocated into two groups:

Group A: Myokinetic Stretching Technique with conventional exercises
Group B: Integrated Neuromuscular Inhibition Technique with conventional exercises

Both groups received treatment three times per week for a duration of two weeks. Outcome measures were reassessed after completion of the intervention period.

Intervention Protocol

Group A: Myokinetic Stretching Technique with Conventional Exercises

Participants in Group A received Myokinetic Stretching Technique to improve muscle extensibility, reduce tightness, and restore functional cervical movement [1,2]. Conventional exercises included:

- Active cervical range of motion exercises
- Isometric strengthening exercises for cervical muscles
- Scapular strengthening exercises
- Postural correction exercises

Group B: Integrated Neuromuscular Inhibition Technique with Conventional Exercises

Participants in Group B received Integrated Neuromuscular Inhibition Technique comprising:

- Ischemic compression
- Strain-counterstrain
- Muscle energy technique [3,4]

This was followed by conventional physiotherapy exercises similar to those given to Group A.

VIII. Statistical Analysis

Data were analyzed using appropriate statistical software. Descriptive statistics were used to summarize demographic and baseline variables. Normality of data distribution was assessed before selecting statistical tests. Parametric tests were applied for normally distributed data, whereas non-parametric tests were used for variables that were not normally distributed. Within-group comparisons were performed to evaluate pre- and post-treatment changes, and between-group comparisons were performed to determine the relative effectiveness of MST and INIT. A p-value of less than 0.05 was considered statistically significant.

IX. Results

The study findings demonstrated statistically significant improvement within both groups following the treatment period. Both the MST group and the INIT group showed improvement in pain intensity, functional disability, and active cervical range of motion.

Within-group analysis indicated that:

- Group A showed significant improvement in VAS, NDI, and ACROM.
- Group B also showed significant improvement in VAS, NDI, and ACROM.

Between-group comparison revealed that:

- Pain reduction, as measured by VAS, did not show a statistically significant difference between the two groups.
- Disability, as measured by NDI, showed a statistically significant difference in favor of Group B.
- Active cervical range of motion also showed significant improvement in favor of Group B.

These findings suggest that while both interventions are beneficial in the management of chronic mechanical neck pain, INIT is superior to MST in improving disability and cervical mobility.

X. Discussion

The present study compared the effects of Myokinetic Stretching Technique and Integrated Neuromuscular Inhibition Technique on pain, range of motion, and disability in individuals with chronic mechanical neck pain. The results demonstrated that both interventions were effective in improving clinical outcomes. However, the INIT group showed greater improvement in disability and cervical range of motion compared with the MST group.

The improvement observed in both groups may be attributed to reduction in muscular tightness, restoration of muscle extensibility, improvement in soft-tissue flexibility, and enhanced cervical movement [1,5,6]. Conventional exercises provided alongside manual therapy may also have contributed to improved muscular support, posture, and functional recovery.

The beneficial effect of MST may be explained by its ability to stretch shortened muscles, improve flexibility, and normalize movement patterns [1,2]. By reducing muscle tightness and enhancing mobility, MST can help relieve symptoms and improve function in individuals with chronic mechanical neck pain.

The superior effect of INIT on disability and range of motion may be related to its combined therapeutic mechanism. Ischemic compression helps in reducing trigger-point sensitivity, strain-counterstrain facilitates muscle relaxation in a pain-free position, and muscle energy technique improves muscle length and joint mobility through neuromuscular facilitation [3,4]. The combination of these methods may provide a more comprehensive effect on myofascial dysfunction than stretching alone.

The absence of a significant between-group difference in pain reduction indicates that both MST and INIT are similarly effective in reducing pain when used with conventional exercises. However, INIT appears to offer additional benefit in terms of improving cervical mobility and reducing functional disability [3,4].

The findings of this study support the clinical use of both interventions in physiotherapy practice. However, when the primary treatment goal is greater improvement in cervical range of motion and functional performance, INIT may be considered the preferable treatment approach.

XI. Conclusion

The present study concluded that both Myokinetic Stretching Technique and Integrated Neuromuscular Inhibition Technique are effective in the management of chronic mechanical neck pain. Both interventions significantly improved pain, disability, and active cervical range of motion within groups. However, Integrated Neuromuscular Inhibition Technique was found to be more effective than Myokinetic Stretching Technique in improving disability and cervical range of motion. No significant between-group difference was observed for pain reduction. Therefore, INIT may be considered a more effective intervention when the treatment objective is to achieve superior improvement in function and cervical mobility in subjects with chronic mechanical neck pain.

XII. Clinical Implications

The findings of this study suggest that both MST and INIT can be used effectively in physiotherapy management of chronic mechanical neck pain. INIT may be preferred in patients presenting with myofascial trigger points, restricted cervical motion, and greater functional disability. The study also emphasizes the value of combining manual therapy with conventional exercises for optimal rehabilitation outcomes.

XIII. Limitations of the Study

- The duration of intervention was short.
- The sample size was limited.
- Only subjects between 18 and 45 years were included.
- Long-term follow-up was not performed.
- Generalization of results to all neck pain populations may be limited.

XIV. Recommendations

- Future studies should include a larger sample size.
- Long-term follow-up should be conducted to evaluate sustained treatment effects.
- Comparative studies involving other manual therapy approaches may be performed.
- Research including different age groups and occupational populations may further strengthen evidence in this area.

XV. Acknowledgment

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