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A COMPARATIVE STUDY OF IONTOPHORESIS WITH MUSCLE ENERGY TECHNIQUE VERSUS PHONOPHORESIS WITH MUSCLE ENERGY TECHNIQUE IN PATIENTS WITH TRAPEZITIS

Physiotherapy

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ABSTRACT

Background: Trapezitis is a common myofascial pain condition involving the upper trapezius muscle, often associated with pain, reduced cervical mobility, and functional disability. Electrotherapeutic drug delivery techniques such as iontophoresis and phonophoresis, when combined with manual therapy, may enhance treatment outcomes. **Objective:** To compare the effectiveness of iontophoresis combined with Muscle Energy Technique (MET) versus phonophoresis combined with MET in reducing pain, improving pressure pain threshold, cervical range of motion, and functional disability in patients with trapezitis. **Methods:** Sixty participants aged 30–45 years diagnosed with trapezitis were randomly allocated into two groups (n = 30 each). Group A received iontophoresis with magnesium sulfate combined with MET, while Group B received phonophoresis using diclofenac gel combined with MET. Interventions were administered five sessions per week for two weeks. Outcome measures included the Numerical Pain Rating Scale (NPRS), Neck Disability Index (NDI), Pressure Pain Threshold (PPT), and cervical range of motion measured using a universal goniometer. Statistical analysis was performed using paired and independent t-tests with significance set at $p < 0.05$. **Results:** Both groups demonstrated statistically significant improvements in pain, disability, pressure pain threshold, and cervical range of motion ($p < 0.001$). Group A showed significantly greater pain reduction and higher improvement in pressure pain threshold compared to Group B ($p < 0.001$). Improvements in cervical range of motion and functional disability were comparable between the two groups. **Conclusion:** Iontophoresis combined with Muscle Energy Technique is more effective than phonophoresis combined with MET for short-term pain reduction and desensitization of myofascial trigger points in patients with trapezitis. Both interventions are equally effective in improving cervical mobility and functional status.

KEYWORDS

Trapezitis; Iontophoresis; Phonophoresis; Muscle Energy Technique; Neck Pain

INTRODUCTION

Trapezitis is a frequently encountered musculoskeletal condition characterized by localized pain, muscle spasm, and functional limitation of the cervical spine. It commonly arises due to sustained postural stress, repetitive activities, and poor ergonomics, particularly among individuals engaged in prolonged desk work or static postures. The upper trapezius muscle is especially vulnerable because of its continuous postural demand and low-level activation.

Myofascial trigger points within the trapezius muscle significantly contribute to pain and restricted movement. Conventional management strategies include manual therapy, electrotherapy, and exercise-based interventions. Muscle Energy Technique (MET) is a widely used manual therapy approach that improves muscle extensibility and joint mobility through controlled isometric contractions.

Iontophoresis and phonophoresis are non-invasive transdermal drug delivery techniques that enhance localized delivery of analgesic and anti-inflammatory agents. Magnesium sulfate used in iontophoresis exhibits muscle-relaxant and analgesic properties, while diclofenac gel used in phonophoresis provides local anti-inflammatory effects. However, limited evidence exists comparing these modalities in combination with MET for the management of trapezitis, which prompted the present study.

MATERIALS AND METHODS

Study Design

Randomized comparative experimental study.

Participants

Sixty patients aged 30–45 years clinically diagnosed with trapezitis were recruited from outpatient departments. Written informed consent was obtained from all participants prior to enrollment.

Inclusion Criteria

- Clinical diagnosis of trapezitis
- Moderate pain intensity
- Restricted cervical range of motion

Exclusion Criteria

- History of cervical spine trauma or surgery
- Cervical spondylosis or disc prolapse
- Neurological deficits
- Pregnancy or inflammatory rheumatic conditions

Outcome Measures

- Numerical Pain Rating Scale (NPRS)
- Neck Disability Index (NDI)
- Pressure Pain Threshold (PPT)
- Cervical Range of Motion (ROM)

Intervention

Group A: Iontophoresis with magnesium sulfate combined with MET
Group B: Phonophoresis with diclofenac gel combined with MET

Procedure

Participants were randomly allocated into two groups using a simple random sampling method. Baseline assessments were recorded for pain intensity, functional disability, pressure pain threshold, and cervical range of motion. Interventions were administered by a qualified physiotherapist in a controlled clinical setting. Each participant received five treatment sessions per week for two weeks, with each session lasting approximately 25–30 minutes.

Group A received iontophoresis using magnesium sulfate of 10mg\cm² applied over the identified myofascial trigger points of the upper trapezius, followed by Muscle Energy Technique. Group B received phonophoresis using diclofenac gel delivered via therapeutic ultrasound, followed by an identical MET protocol. Post-intervention assessments were conducted using the same outcome measures.

Statistical Analysis

Data were analyzed using SPSS version 26.0. Within-group comparisons were performed using paired t-tests, and between-group comparisons were conducted using independent t-tests. Statistical significance was set at $p < 0.05$.

RESULTS

Both groups demonstrated statistically significant improvements in NPRS, NDI, PPT, and cervical range of motion following the intervention ($p < 0.001$). Group A exhibited significantly greater pain

reduction and improvement in pressure pain threshold compared to Group B ($p < 0.001$). Improvements in cervical range of motion and functional disability were significant within both groups but did not differ significantly between groups.

DISCUSSION

The findings of the present study indicate that the combination of iontophoresis and Muscle Energy Technique provides superior pain relief and myofascial trigger point desensitization compared to phonophoresis combined with MET in patients with trapezitis. The enhanced effectiveness of iontophoresis may be attributed to the targeted transdermal delivery of magnesium sulfate, facilitating neuromuscular relaxation and reduction of nociceptive sensitivity.

Both treatment approaches were equally effective in improving cervical range of motion and functional disability, emphasizing the pivotal role of Muscle Energy Technique in restoring muscle extensibility, reducing spasm, and enhancing cervical biomechanics. These findings are consistent with previous studies supporting the efficacy of MET in managing upper trapezius myofascial pain.

CONCLUSION

Iontophoresis combined with Muscle Energy Technique is more effective than phonophoresis combined with MET for short-term pain reduction and improvement in pressure pain threshold in patients with trapezitis. Both interventions are equally effective in improving cervical mobility and functional disability. Iontophoresis may therefore be preferred when rapid pain relief is the primary clinical objective.

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