

Abstract

The Effect of Positional Release Techniques and Muscle Energy Technique Applied to Latent Myofascial Trigger Points of the Sternocleidomastoid Muscle on Cervical Spine Range of Motion and Bioelectrical Activity of Selected Muscles

Introduction

The presence of myofascial trigger points in the muscles surrounding the cervical spine significantly contributes to the development of pain syndromes. This condition is highly prevalent and negatively affects both quality of life and work productivity.

Aim

The aim of this study was to evaluate the effects of Positional Release Techniques and the Muscle Energy Technique applied to latent myofascial trigger points of the sternocleidomastoid muscle on cervical spine range of motion, quality of life, pain pressure threshold, and bioelectrical activity of selected muscles.

Materials and Methods

A total of 108 university students aged 19–26 years from Kraków were included in this randomized controlled, parallel-group study. Participants were randomly assigned to three groups (A, B, and C), each consisting of 36 individuals. Group A received a combination of Positional Release Techniques (Jones method) and the Muscle Energy Technique (Chaitow). Both groups A and B followed an identical standardized home-based exercise program targeting the cervical spine, performed daily for three weeks, and received postural education. Group C served as a control group and did not receive any intervention. All participants underwent repeated measurements, including cervical spine range of motion, pain pressure threshold, and bioelectrical activity of selected muscles.

Results

The results demonstrated a significant effect of time (measurement points 1–4) for the Visual Analog Scale (VAS), with no significant group $\times$ time interaction ($p > 0.05$). A strong time effect was observed for quality of life ($F(1.37, 143.40) = 94.51$; $p < 0.001$; $\eta^2 = 0.474$; Greenhouse–Geisser $\epsilon = 0.46$), along with a significant interaction between group and time ($F(2.73, 143.40) = 19.389$; $p < 0.001$; $\eta^2 = 0.270$). A significant reduction in quality of life scores was observed at the second measurement in groups A and B, whereas no significant changes were found in the control group. Both intervention groups (A and B) showed a statistically significant increase in pain pressure threshold across all examined muscles, while no significant changes were observed in the control group ($p > 0.05$). Analysis of cervical spine range of motion revealed significant

improvements in flexion, extension, and right lateral flexion in both groups A and B. Additionally, group B demonstrated a significant increase in left cervical rotation. No significant changes were observed in the control group. No significant interaction between group and time was found for left lateral flexion. Following the interventions, both groups A and B showed a significant reduction in resting bioelectrical activity in all examined muscles. A significant decrease in bioelectrical activity of the right sternocleidomastoid muscle during unilateral contraction was observed in both groups, along with reduced activity in the right upper trapezius muscle. Similarly, a significant reduction in left sternocleidomastoid muscle activity during unilateral contraction and decreased upper trapezius activity were observed. During shoulder elevation, both groups demonstrated a significant reduction in upper trapezius activity bilaterally, while a decrease in sternocleidomastoid activity was observed only in group A. No significant changes in bioelectrical activity were found in the control group, either at rest or during functional tasks ($p > 0.05$).

Conclusions

The applied interventions demonstrated beneficial effects across most analyzed parameters, improving musculoskeletal function, including cervical spine mobility, quality of life, bioelectrical muscle activity, and pain pressure threshold. A functional relationship between the sternocleidomastoid muscle and the upper trapezius muscle was observed. From a clinical perspective, both the combined therapy (Positional Release Techniques and Muscle Energy Technique) supplemented with targeted exercises, as well as exercise alone, may constitute effective components of physiotherapy programs for patients with cervical spine dysfunction.