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COMPARISON OF THE EFFECTS OF TWO PHYSIOTHERAPY APPROACHES IN THE TREATMENT OF CERVICO-THORACIC SYNDROME

Ivica Docevski[1], Toshe Krstev[1]*

[1]Faculty of Medical Sciences, Goce Delcev University, Stip, North Macedonia,
e-mail: ivica.211471@student.ugd.edu.mk, tose.krstev@ugd.edu.mk

Abstract: Cervico-thoracic syndrome is extremely common in modern life, which motivated us to investigate it - specifically in the cervico-thoracic region. This condition is characterized by impaired posture, often resulting in pain, which is the most frequent complaint among affected individuals.

Objective: The aim of this study was to examine and compare the effects of selected physiotherapeutic interventions in the treatment of cervico-thoracic syndrome.

Materials and Methods: The study included 24 patients experiencing cervical pain accompanied by motor deficits and postural disturbances. Participants were divided into two groups: Group A (control) and Group B (experimental). Both groups underwent a physiotherapy program consisting of 10 sessions over 15 days. Group A (Control): Ultrasound therapy applied to the cervico-thoracic junction, medical massage of the cervico-thoracic region, post-isometric relaxation, and kinesitherapy. Group B (Experimental): Techniques for soft tissue mobilization in the form of manipulative massage, positional release techniques, and kinesitherapy. To assess treatment effectiveness, measurements were taken before and after therapy, including subjective pain assessment (VAS), Cervical mobility palpatory evaluation of muscle tone.

Results: Both therapeutic approaches demonstrated positive effects on patients' conditions, with slightly better outcomes observed in the experimental group. Differences were noted across all measured parameters.

Conclusion: The application of soft tissue manipulation techniques combined with kinesitherapy has a beneficial effect on pain reduction, correction of muscle imbalance, and improvement of movement range and control. Restoration of normal function begins with pain control, which enables better and more accurate proprioception. These findings are consistent with previous research.

Keywords: Cervico-thoracic syndrome, physiotherapy, kinesitherapy, soft tissue mobilization
Field: Medical sciences

1. INTRODUCTION

Pain symptoms and syndromes in the back and neck are often caused by well-defined morpho-functional changes in the spine and adjacent tissues. Clinical manifestations are frequently influenced by environmental factors, particularly cold and humid conditions. The patient's occupation is also relevant to the onset and severity of symptoms. Complex interactions exist between intervertebral discs and surrounding muscles on one hand, and neural structures represented by the spinal cord on the other. Cervico-thoracic syndrome is extremely common in modern life, which prompted us to investigate it—specifically in the cervico-thoracic region. This condition is characterized by impaired posture, resulting in pain, which is the most frequent complaint among affected individuals. Kinesitherapy can play a significant role in reducing and eliminating symptoms and complications, thereby improving quality of life.

The aim of this study was to explore and compare the effectiveness of combining different physiotherapeutic methods and techniques in patients with "cervico-thoracic syndrome" and to analyze their outcomes.

2. MATERIALS AND METHODS

This research represents a prospective, comparative study with repeated measurements—an experiment involving two groups of patients with neck pain and cervico-thoracic junction discomfort, accompanied by functional and postural disturbances. The study was conducted at the Physiotherapy Clinic "Fiziotema" in Kochani between March and June 2025. A total of 24 patients were included, all experiencing neck pain and cervico-thoracic discomfort, which interfered with daily activities and proper posture. Patients were randomly assigned to two groups: Group A (Control): 12 patients received a

*Corresponding author: ivica.211471@student.ugd.edu.mk

program consisting of classical massage, ultrasound therapy, post-isometric relaxation, and kinesitherapy. Group B (Experimental): 12 patients underwent treatment involving manual soft tissue mobilization, positional release techniques, and kinesitherapy. The kinesitherapy program was identical for both groups. The primary goals were muscle relaxation, pain relief (analgesia), restoration of active mobility, and improvement of spinal stability. The cervical segment of the spine is characterized by high mobility; however, increased mobility reduces stability, which often leads to so-called functional blockages and associated muscle imbalance. These factors primarily affect the range of motion in this region and contribute to patient pain. To examine and compare the effects of the applied programs, the following evaluations were performed subjective assessment of pain intensity, range of active movements, passive movements, and accessory joint mobility in the cervical region, presence of muscle imbalance, presence of dizziness and subjective complaints Visual Analogue Scale (VAS), Measurement of active range of motion (in cm) in all three planes of movement: Flexion and extension: Distance from the chin to the upper edge of the proc. Xiphoideu, Left and right lateral flexion: Distance from proc. mastoideus to proc. acromialis, without scapular elevation, Left and right rotation: Distance from the lower edge of the chin to proc. acromialis (H. Debrunner & W. Hep, 1995), Palpatory assessment of muscle hypertonus in static muscles according to J. Dvorak et al. (1997). The tone of the following muscles was analyzed after preliminary stretching: m. trapezius-pars descendens, m. levator scapulae, m. sternocleidomastoideus, m. pectoralis major, and mm. scaleni. Results were obtained using the numerical scale proposed by L. Krajčíková (1999). Manual examination of passive movements and accessory joint mobility in the cervical segment from cranial to caudal direction, including physiological (angular) movements, considering the motion of pr. spinosi and the distance between them within a motor segment, rotation from flexion: Differentiates blockages in upper or lower cervical region, Rotation from extension, Inclination (tilting), Complex axial traction and assessment of translatory sliding in lateral and ventro-dorsal directions and/or with rotation (fixation of the caudally positioned vertebra using a soft “fork-like” grip). Hautant’s Test for latent dizziness. The patient sits with eyes closed and arms extended. Deviations to the left or right are observed, noting that the pathological direction of deviation often coincides with the direction of blockage. Presence of subjective complaints: headache, dizziness, neck stiffness, and tinnitus. Patients underwent a physiotherapy course consisting of 10 sessions over a 15-day period, with each treatment lasting approximately one hour.

3. RESULTS

The results from the assessment of pain are presented in Table 1. The initial pain levels were high in both groups (Group A = 7.25 ± 0.07; Group B = 7.45 ± 0.04). After treatment, pain decreased significantly in both groups, with slightly greater improvement observed in the experimental Group B (difference d_2–d_1 = 1.14). This notable reduction can be attributed to the strong relaxing effect of manipulative massage, myofascial release techniques, positional release, and post-isometric relaxation, as well as improved joint play resulting from manual mobilization techniques and exercises aimed at enhancing intervertebral sliding within the motor segment. Another important factor contributing to these results is the relatively young age of the patients, who exhibited no pronounced structural changes in vertebrae or intervertebral discs. This allowed for rapid improvement in functional capacity of the affected segment, significant pain reduction, and overall enhancement of quality of life.

Table 1. Self-assessment of pain intensity (VAS)

VAS	N	x1 ± s1	x2 ± s2	d = x2-x1	d2-d1
Group A	12	7,25±0.07	2,54±0.02	4.71	1,14
Group B	12	7,45±0.04	1,60±0.06	5,85	

Source: Author’s research

In addition, we observed a psychological benefit from manual techniques combined with active kinesitherapy. After focused, well-executed kinesitherapy sessions, including locally applied manual techniques, patients reported immediate effects such as pleasant warming, muscle relaxation in the cervical region and shoulder girdle, improved freedom of movement, and pain relief. Muscle stiffness was present in all patients. Pain reduction and elimination of functional blockages (restrictive factors in cervical motion) through neurophysiological mechanisms decreased muscle hypertonus and promoted relaxation of static muscles. Symptoms such as dizziness and tinnitus, reported by some patients, were almost eliminated by the end of the treatment course. This strong analgesic effect can be explained

by breaking the pathological cycle between segmental nociceptive irritation in intervertebral joints and muscles and motor efferentation. Improved joint play and reduced disc-related stress restored cervical joint mobility, thereby reducing pain. Enhanced blood supply to the cervico-cranial and cervical spine (via myofascial techniques) and improved elasticity of static musculature contributed to deconditioning of the region and elimination of most triggers. We believe that the most significant results were achieved through manipulative massage and positional release techniques, as these primarily target painful muscle points and support the body's autoregulatory mechanisms. Passive movements combined with manual mobilization techniques not only improved cervical spine mobility in all possible axes and eliminated stiffness and blockages (if present) but also contributed to pain reduction. Table 2 presents the measurements of pathological muscle hypertonus. Increased tone was observed in varying degrees across different muscles, resulting in muscle imbalance and impaired head and neck posture.

Table 2. Assessment of Pathologically Increased Muscle Tone

MT	Muscle	Group	x1 ± s1	x2 ± s2	d = x2-x1	d2-d1
	m. trapezius – pars descendens	Group A	2,87±0.12	1,68±0.67	1,19	0,65
		Group B	2,79±0.34	0,95±0.11	1,84	
	m. levatorscapulae	Group A	2,88±0.72	1,38±0.58	1,5	0,27
		Group B	2,76±0.07	0,99±0.25	1,77	
	m. sternocleidomastoideus	Group A	2,39±0.47	0,50±0.07	1,89	0,32
		Group B	2,62±0.28	0,41±0.97	2,21	
	m. pectoralis major	Group A	2,24±0.33	0,97±0.49	1,27	0,36
		Group B	2,37±0.38	0,74±0.70	1,63-	

Source: Author's research

The highest hypertonus was recorded in m. levator scapulae (2.88 points) and m. trapezius – pars descendens (2.87 points), ranging from moderate to severe shortening. The lowest tone increase was observed in m. pectoralis major (average 2.24 points).

4. DISCUSSIONS

The findings of this study confirm the effectiveness of physiotherapeutic interventions in managing cervico-thoracic syndrome, with notable differences between the two treatment protocols. Both groups demonstrated significant improvements in pain reduction, cervical mobility, and muscle tone normalization; however, the experimental group (Group B), which received myofascial techniques, manipulative massage, and positional release, achieved superior outcomes compared to the control group. Pain reduction, as measured by VAS, was more pronounced in Group B (mean decrease of 5.85 points) than in Group A (4.71 points). This aligns with previous research emphasizing the role of manual therapy in breaking the pathological cycle between nociceptive irritation and muscle hypertonus. The analgesic effect observed in this study can be attributed to improved joint play, restoration of proprioception, and enhanced blood circulation facilitated by soft tissue mobilization techniques. Cervical range of motion improved significantly in both groups, with the greatest gains observed in rotation and lateral flexion—movements most affected by functional blockages and muscle imbalance. Group B showed nearly double the improvement compared to Group A, highlighting the added value of manual mobilization techniques in restoring segmental mobility. These results support the hypothesis that targeted manual therapy combined with kinesitherapy provides a synergistic effect, improving both passive and active movement patterns. Muscle tone assessment revealed marked hypertonus in key stabilizing muscles, particularly m. levator scapulae and m. trapezius – pars descendens. Post-treatment measures indicated substantial relaxation in both groups, with Group B again demonstrating greater improvement. This suggests that positional

release and manipulative massage effectively address muscle shortening and facilitate neuromuscular rebalancing, consistent with Levitt's observations on the analgesic and relaxation effects of manual techniques. An additional observation was the psychological benefit reported by patients following manual therapy sessions, including sensations of warmth, relaxation, and improved freedom of movement. These subjective responses likely contribute to overall treatment success by enhancing patient compliance and reducing fear-avoidance behaviors. The relatively young age of participants, with minimal structural changes in vertebrae and intervertebral discs, may have amplified the effectiveness of the interventions. Future studies should examine whether similar outcomes can be achieved in older populations or those with degenerative changes. Overall, the results underscore the importance of integrating manual therapy techniques with active exercise programs for comprehensive management of cervico-thoracic postural disorders. This multimodal approach not only alleviates symptoms but also addresses underlying biomechanical dysfunctions, promoting long-term functional recovery and improved quality of life.

5. CONCLUSIONS

The application of combined physiotherapeutic methods demonstrated significant benefits in reducing pain, improving cervical spine mobility, and correcting muscle imbalance in patients with cervico-thoracic syndrome. Both treatment protocols were effective; however, the experimental program—incorporating myofascial techniques, manipulative massage, and positional release—produced superior outcomes compared to the conventional approach.

Pain reduction was accompanied by restoration of proprioception and functional mobility, while manual mobilization techniques contributed to improved joint play and muscle relaxation. These effects were further enhanced by kinesitherapy, which supported long-term stability and movement control. The results confirm that integrating manual therapy techniques with active exercise programs is a highly effective strategy for managing cervico-thoracic postural disorders, particularly in younger patients without advanced structural changes. This approach not only alleviates symptoms but also improves quality of life by restoring normal function and reducing recurrence risk.

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