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Original Article

The Effectiveness of Therapeutic Massage and Complementary Techniques in the Treatment of Lumbalgias of Various Etiologies

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Abstract

The objectives of the study were to select and combine some treatment methods and techniques, with the aim of reducing the symptoms of the subjects in a shorter time and with lasting effects. The paper represents a study carried out on a group of 10 subjects with lombalgia of different causes, divided into 2 groups, one control and one experimental. The subjects of the control group benefited from a program of electrotherapy and the experimental group, from the same therapy, but additionally included in the treatment, therapeutic massage (myofascial, Cyriax), myotensive techniques, joint mobilizations, isometric stretching. The treatment lasted four weeks with a frequency of 3 sessions/week. The results of the study showed an reduction of pain, improvement of muscle trophicity and elasticity, increase of range of motion, improvement of capsulo-ligamentous elasticity, in subjects who additionally had the applications of therapeutic massage and complementary techniques during the intervention.

1. Introduction

Pain in the lumbosacral spine is associated with discopathy or the presence of a radicular conflict. In addition, other possible sources of pathology should not be ignored, such as in the sacroiliac joints, interspinous processes, rheumatic, myofascial, or even oncological conditions. The prevalence of low back pain is 60-80%, so an individual will have at least one lumbalgia episode during life (Gnjidic, 2011; Hoy, Brooks, Blyth, & Buchbinder, 2010). Due to the increased range of

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motion of the lumbar spine and the pressures it is subjected to, painful symptoms appear in this region in approximately 65% of cases—72% among individuals under 40 years old. In terms of sex, this pathology occurs in about 30% of women and 66% of men (Krawczyk-Suszek, 2021).

The gate-control theory predicts that massaging a particular area stimulates large diameter nerve fibers. These fibers have an inhibitory input onto T-cells (which are the first cells that project into the central nervous system within the spinal cord). T-cell activity is depressed (whereas, conversely, small diameter nerve fibers (nociceptive fibers) have an excitatory input) and pain relief follows. Massage therapy may provide its benefits by shining the autonomic nervous system from a state of sympathetic response to a state of parasympathetic response. However, support for this theory is not universal, and it has even been suggested that massage therapy may promote a sympathetic response of the autonomic nervous system (Moyer, 2004). The mechanistic links between manipulation of body tissues and corresponding relief from a broad range of symptoms are not fully understood. Mechanistic studies are needed to delineate underlying biologic and psychological effects of massage and their relationship to outcomes.

Chun, Lim, Kim and Hwang, (2017) found a strong cross-sectional relationship of reduced lumbar lordosis and low back pain. In a meta-analysis of prospective cohort studies, limited lordosis predicted the development of low back pain with an odds ratio of 1.27. A systematic review found that, among pharmacological interventions for NSLBP, NSAIDs and muscle relaxants offer the most favorable risk-benefit ratio for pain and disability management. However, exercise and manual therapy are considered more effective first-line treatments and should be prioritized over pharmacological options (Gianola et al., 2022; Hayden, van Tulder, Malmivaara, & Koes, 2005).

According to research, it is believed that 90% of back pain is considered non-specific, with the exact cause being unidentifiable—one of the main reasons being myofascial disturbances (Ożóg, Weber-Rajek, & Radzimińska, 2023). Disorganized myofascia includes both localized areas of pain and distant sites of referred pain. Myofascial disorders distant from the pain site can cause back pain through numerous functional connections. Myofascial release is a form of manual therapy aimed at the myofascial system, which gradually returns to normal through mechanical stimulation of connective tissue and increased myofascial flexibility, thereby reducing the patient's pain and improving their overall health. It is most widely used in the treatment of chronic back pain (Yangting, & Yiwen, 2024).

2. Material and methods

2.1. Study design

The study was conducted using a non-randomized control trial study design. Informed consent was obtained from all participants involved in the study. Also, the subjects could withdraw from the study at any moment.

2.2. Study participants

Two groups of subjects, one control and one experimental, were selected for this research. Both groups consisted of five female patients, aged between 40-50 years, presenting lumbalgia symptoms of various etiologies.

Table 1. *Experimental group*

No.	Initials	Age (years)	Sex	Clinical diagnosis
1.	**R.P.**	42	F	L5 lumbar discopathy, S-shaped dorsal scoliosis with grade I axial rotations and slight biconcave compression of a mid-dorsal vertebral body, lumbar spine straightening
2.	**F.I.**	40	F	L5-S1 lumbar polydiscopathy; L5-S1 spondylolisthesis; mild lateral disc narrowing at L1-L2 and L4-L5 on the left side, and posterior disc narrowing at L3-L4, L4-L5, and L5-S1
3.	**B.M.**	40	F	L5-S1 lumbar discopathy. Overuse syndrome. Mild dextroconcave scoliosis of the lumbar spine, with a maximum curvature at the L2-L3 level; slight reduction in intervertebral space height at L5-S1
4.	**M.A**	46	F	Right L4-L5 disc herniation with compression of the sciatic nerve
5.	**A.C.**	49	F	L4-L5 disc herniation

Table 2. *Control group*

No.	Initials	Age (years)	Sex	Clinical diagnosis
1.	**T.B.**	44	F	Moderate median disc protrusion at L4-L5 without clear signs of radicular conflict; moderate disc herniation at L5-S1 with minimal sign of left S1 radicular conflict
2.	**C.S.**	45	F	Small intravertebral hernias at the level of the vertebral endplates adjacent to the T12-L1 intervertebral disc
3.	**E.H.**	49	F	L4-L5 lumbar polydiscopathy, right convex lumbar scoliosis with disc narrowing at L2-L3 and L4-L5 on the right side, profile straightening
4.	**T.M**	50	F	Right L4-L5 disc herniation with compression of the sciatic nerve
5.	**B.L**	40	F	L4-L5 lumbar discopathy

Patient admission into the study was carried out based on the following criteria:

- common clinical diagnosis: lumbalgia;
- no contraindications for physiotherapeutic treatment (cardiac, respiratory conditions, malignant diseases, etc.);
- not in the inflammatory phase;
- not suffering from disabling diseases;
- must give consent for treatment;
- must not have undergone electrotherapy or physical therapy in the last 2 months.

Exclusion criteria were osteoporosis, spinal tumor, vertebral fractures and surgery, metabolic or infectious diseases, and no physical therapy treatment received in the last six months.

Both groups of subjects received individualized and personalized treatment based on antalgic physiotherapy, including: High Intensity Laser Therapy, Electrostimulation (COMPEX), Cryotherapy, Shockwave Therapy, while the experimental group additionally received therapeutic massage, Cyriax deep tissue massage, myofascial massage, myotensive techniques, joint mobilizations, and isometric stretching.

The subject evaluation was performed using the following tests: the anamnesis, the physical examination, the Flag System (Ladeira, 2018; Leerar, Boissonnault, Domholdt, & Roddey, 2007), the Visual Analog Scale (VAS) (Mungiu, 2007; Hjermstad et al., 2011), Joint assessment for the thoracolumbar spine (normal values: flexion 80-90°, extension 20-30°, lateral bending 20-35°, rotation 30-45°), Functional Tests for evaluating the amplitude of the thoracolumbar spine (Sagittal fingertip-to-floor distance, Lateral right and left digit-tibia distance, “Sternum-wall” index, “Schober” test, “Stibor” test) (Cordun, 2009), Specific tests for detecting radicular inflammation: Lasegue’s test, Erickson’s maneuver, Wolkmann’s maneuver, Tripod sign (Kiss, 2002), Percussion test of the spinous processes.

Physical therapy intervention

The physical therapy goals were as follows: reducing pain; decreasing reflex antalgic contractions and preventing the onset of contractures; improving muscular functional properties; enhancing trophism through activation of blood circulation; correcting muscle imbalances; improving joint mobility and range of motion; preventing reflex antalgic postures; restoring proper movement control;

Each subject received 10 physical therapy sessions, with a frequency of three sessions/ week.

The physical therapy intervention for both groups consisted of:

High Intensity Laser Therapy – is a non-invasive physiotherapy procedure that acts on tissues, having the following effects: analgesic, muscle relaxant, anti-edematous, tissue and biological process stimulation, regeneration, and vasodilatory effects. The high power of up to 12W allows deep tissue penetration for long-lasting pain therapy. The maximum power is up to 50 times greater than in LLLT. The BTL High Intensity Laser System provides highly effective treatment for a wide range of clinical indications, ranging from muscle and joint injuries to degenerative tendinopathies. The patient in a prone position, with the lumbar area free, I applied high-intensity laser therapy to the L4-L5-S1 area for 2.30 minutes on each side.

Electrostimulation (COMPEX) – involves stimulating nerve fibers through high-quality electrical impulses transmitted by electrodes. The stimulation works a much larger number of muscle fibers than voluntary work (over 85% of muscle fibers). At the same time, with maximum efficiency, it helps treat acute, chronic, or muscular pain. The patient in a prone position, the lumbago program for lumbar pain was applied for 10 minutes, then the toning program for the latissimus dorsi for 10 minutes, and then trunk extension from a prone position with support on the forearms.

Cryotherapy is another valuable recovery aid that uses –30 degrees Celsius to cool a body segment. The cold air therapy creates a mild anesthesia, with no risks, allowing patients to tolerate the therapy without any issues. The effects are: reduced local metabolism, vasoconstriction (followed by protective vasodilation), reduced edema, muscle relaxation, and pain and inflammation reduction (http://www.bluesport.ro/). The patient in a prone position, cryotherapy is applied to the lumbar area for 3 minutes at a speed of 5.

Shockwave therapy represents a non-invasive solution for musculoskeletal pain. Shockwave therapy is frequently used in physiotherapy, orthopedics, and sports medicine. The applications are most associated with the treatment of chronic muscle and tendon disorders, back and cervical pain. Some of the most common indications include: shoulder pain, epicondylitis, low back pain, Achilles tendinitis, tendinitis, and muscle knots (trigger points).

The experimental sample additionally benefited from the following intervention:

Myofascial release techniques (MFR): myofascial massage, stretching, muscle energy techniques, and myofascial trigger points therapy for the following muscles: quadratus lumborum, gluteals, pelvis-trochanteric muscles, iliopsoas, iliolumbar and sacroiliac ligaments, etc.

Myofascia is an important source of proprioception, so myofascial restriction may lead to inhibition of proprioception, resulting in decreased lumbar function. MFR can partly reduce the inhibition of specific proprioceptors, and has positive effects on improving neural control, activating inhibited muscles, and enhancing lumbar function (Ziyan Chen, Jinlong Wu, Xiaodong Wang, Jieqing Wu, & Zhanbing Ren, 2021).

The therapeutic massage started with *effleurage,* using a series of long and slow strokes from the bottom up, from the sacral region to the neck, covering the entire lumbar and dorsal area. Initially, both palms, with fingers extended and apart, moved upward along the spine, parallel to it, gradually transitioning to a slightly oblique direction to cover the entire surface. It was worked simultaneously until desensitization was achieved, then alternated. The medium strokes were performed obliquely upwards and laterally, on the hips, flanks, ribs, scapulae, and shoulders, both simultaneously and alternately. They were applied with one hand, both hands, “hand over hand,” “hand upon hand,” adapting to the stretch and contour of the respective area. The application was linear, wavy/zigzag, simple or combined with pressures and vibrations.

Friction was applied initially with the whole palm and extended fingers to cover as much surface area as possible. To adapt the technique to the shape and contour of the region, the consistency of the skin and tissues, and to increase intensity, friction techniques were also performed with the root of the hand, with the fist (palmar or ulnar side), with the ulnar edge of the hand (around the scapulae), and with the palmar side of the fingers (in a circular motion on the paravertebral muscles and in a linear motion in the intercostal spaces).

Kneading was applied using all techniques, depending on the elasticity of the skin and the existing muscle masses. At the base of the neck towards the shoulders, kneading was combined with friction.

Vibrations were associated with pressures on the dorsal and flank areas to assist respiratory movements, applying them during the expiration phase. Among secondary techniques, static pressure was applied with the thumbs on the paravertebral muscles. The back massage was concluded with a finishing effleurage, gradually decreasing the frequency and intensity of the strokes.

At the level of reflex antalgic contractions, the massage was applied progressively with moderate intensity. After the first sessions, the massage was performed directly on the contracture and myofascial trigger points, supporting the tissue with one hand, while using the other hand to apply friction, starting with a larger contact surface and then with a smaller surface using the palmar side of the fingers. The techniques used included deep friction, static pressure, and vibrations. Tissue stretches were also applied, stabilizing the sacrum with one hand and applying pressure diagonally with the other hand.

Application of deep tissue massage (DTM):

DTM on the piriformis muscle: The subject was in a prone position, and the therapist was on the affected side. The muscle was located between the anterior surface of the sacrum and the greater trochanter of the femur. Friction was performed transversally with the thumbs, supported by the other fingers.

DTM on the quadratus lumborum muscle:

The subject was in a prone position, and the therapist was on the affected side. The muscle was located between the iliac crest and the transverse processes of the lumbar vertebrae and the twelfth rib. Friction was performed transversally with the thumbs, supported by the other fingers.

DTM on the lumbar paravertebral muscles (iliocostalis – lumbar portion)

The subject was in a prone position, and the therapist was on the affected side. Friction was applied paravertebrally with three fingers, transversally, from the sacrum upwards.

DTM on the sacroiliac ligament:

The subject was in a prone position, and the therapist was on the affected side. Friction was performed with the index finger supported by the middle finger. For the superior sacroiliac ligament: deep pressure was applied, forward and slightly outward, on the iliac crest; for the inferior sacroiliac ligament, lighter posteroanterior pressure was applied; low-intensity friction was applied, directed from top to bottom, from the posterior-superior iliac spine to the greater sciatic notch.

DTM on the iliolumbar ligament:

The subject was in a prone position, and the therapist was on the affected side. With the hand in pronation, the index finger was reinforced by the other hand. The direction of the pressure had two components: one vertical, posteroanterior, touching the internal margin, and another cranio-caudal, pressing perpendicular to the element. The lateral edge of the finger was placed above the iliac crest, maintaining contact with its internal edge.

Myotensive techniques were applied analytically to muscles (piriformis, quadratus lumborum, tensor fasciae latae, gluteals, paravertebrals, etc.), alternating passive stretching, isometrics for 6 seconds, muscle relaxation without changing muscle tension, and stretching until a new structural movement limit was reached. In the same direction, the technique was repeated approximately 3-4 times on the same muscle group.

Joint mobilization and high-velocity low amplitude techniques were applied at the lumbar and thoracic level (Blanpied et al., 2017). The joint mobilizations aimed to reach the structural limit at the level of the sacrum, lumbar area, and pelvis, performed slowly, in the restricted direction until the pain limit, to avoid triggering the stretch reflex and reflex antalgic contractions.

3. Results and Discussions

- *Results of the experimental group (VAS)*

Table 3. *Results for VAS – experimental group*

Initials	**Muscle pains**						**Ligament pains**			
	Piriformis		**Quadratus lumborum**		**Paravertebral muscles**		**Sacroiliac ligament**		**Iliolumbar ligament**	
	I.T.	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**
R.P.	9	2	7	2	8	1	6	2	5	2
F.I.	8	1	6	1	7	1	4	1	6	2
B.M.	7	1	7	2	8	2	4	1	4	1
M.A	7	2	8	2	7	1	6	2	5	1
A.C.	9	1	8	1	8	2	5	1	6	1

- *Results of the control group (VAS)*

Table 4. *Results for VAS – control group*

Initials	**Muscle pains**						**Ligament pains**			
	Piriformis		**Quadratus lumborum**		**Paravertebral muscles**		**Sacroiliac ligament**		**Iliolumbar ligament**	
	I.T.	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**
T.B.	8	5	9	6	8	4	5	3	5	4
C.S.	9	6	9	4	9	5	4	2	5	4
E.H.	7	4	8	5	8	4	6	4	6	4
T.M	8	4	8	4	8	5	4	3	5	3
B.L	9	5	9	4	9	5	5	4	5	4

- *Results for the joint assessment of the experimental group*

Tabel 5. *Joint assessment results*

Joint assessment												
Initials	**Flexion**		**Extension**		**Lateral right inclination**		**Lateral left inclination**		**Right rotation**		**Left rotation**	
	I.T.	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**
R.P.	63^{o}	75^{o}	15^{o}	20^{o}	18^{o}	27^{o}	15^{o}	24^{o}	17^{o}	25^{o}	20^{o}	27^{o}
F.I.	45^{o}	65^{o}	10^{o}	18^{o}	13^{o}	20^{o}	16^{o}	23^{o}	18^{o}	25^{o}	22^{o}	28^{o}
B.M.	60^{o}	70^{o}	13^{o}	23^{o}	15^{o}	22^{o}	18^{o}	26^{o}	25^{o}	32^{o}	27^{o}	37^{o}
M.A	68^{0}	75^{0}	15^{0}	25^{0}	20^{0}	30^{0}	15^{0}	25^{0}	25^{0}	35^{0}	20^{0}	30^{0}
A.C.	55^{0}	60^{0}	10^{0}	20^{0}	15^{0}	25^{0}	17^{0}	28^{0}	30^{0}	40^{0}	32^{0}	43^{0}

- *Results for the joint assessment of the control group*

Table 6. *Joint assessment results*

Joint assessment												
Initials	**Flexion**		**Extension**		**Lateral right inclination**		**Lateral left inclination**		**Right rotation**		**Left rotation**	
	I.T.	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**
T.B.	60^{o}	68^{o}	16^{o}	19^{o}	20^{o}	23^{o}	15^{o}	20^{o}	18^{o}	22^{o}	20^{o}	23^{o}
C.S.	50^{o}	55^{o}	10^{o}	15^{o}	15^{o}	18^{o}	13^{o}	19^{o}	15^{o}	20^{o}	17^{o}	22^{o}
E.H.	48^{o}	54^{o}	15^{o}	17^{o}	13^{o}	18^{o}	18^{o}	22^{o}	22^{o}	27^{o}	24^{o}	28^{o}
T.M	55^{0}	62^{0}	10^{0}	15^{0}	10^{0}	18^{0}	15^{0}	23^{0}	20^{0}	30^{0}	15^{0}	25^{0}
B.L	50^{0}	60^{0}	12^{0}	20^{0}	10^{0}	20^{0}	13^{0}	22^{0}	15^{0}	22^{0}	18^{0}	28^{0}

- *Results for the lumbar spine mobility tests (experimental group)*

Table 7. *Results for the lumbar spine mobility*

Mobility tests (cm)												
Initials	**Sagittal fingertip-to-floor distance**		**Lateral right digit-tibia distance**		**Lateral left digit-tibia distance**		**“Sternum-wall” index**		**Schober Test**		**Stibor Test**	
	I.T.	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**	**I.T.**	**F.T.**
R.P.	-50	-32	-60	-54	-57	-50	14	19	12	15	5	9
F.I.	-46	-36	-68	-58	-62	-56	8	12	11	14	4	9
B.M.	-47	-28	-54	-45	-55	-48	12	20	13	15	6	9
M.A	-55	-42	-62	-46	-58	-44	10	15	15	20	6	8
A.C.	-42	-33	-60	-45	-56	-42	13	16	12	19	7	9
Average	-48	-34.2	-60.8	-49.6	-57.6	48	11.4	16.4	12.6	16.6	5.6	8.8

- *Results for the lumbar spine mobility tests (control group)*

Table 8. *Results for the lumbar spine mobility*

Initials	Mobility tests (cm)											
	Sagittal fingertip-to-floor distance		Lateral right digit-tibia distance		Lateral left digit-tibia distance		"Sternum-wall" index		Schober Test		Stibor Test	
	I.T.	F.T.	I.T.	F.T.	I.T.	F.T.	I.T.	F.T.	I.T.	F.T.	I.T.	F.T.
T.B.	-48	-38	-55	-53	-50	-45	12	14	11	13	6	8
C.S.	-50	-45	-60	-57	-57	-54	10	12	10	12	4	7
E.H.	-45	-33	-56	-53	-53	-50	13	15	12	14	5	9
T.M	-49	-42	-54	-50	-56	-51	11	14	13	16	6	7
B.L	-52	-46	-50	-44	-52	-48	10	13	11	14	5	7
Average	-48.8	-40.8	-55	-51.4	-53.6	-49.6	11.2	13.6	11.4	13.8	5.2	7.6

- *Specific tests for detecting radicular inflammation*

Table 9. *Results for Specific tests for detecting radicular inflammation*

Initials	Experimental group									
	Lasegue Test		Percussion test of the spinous processes		Erickson Maneuver		Wolkman Maneuver		Tripod sign	
	I.T.	F.T.	I.T.	F.T.	I.T.	F.T.	I.T.	F.T.	I.T.	F.T.
R.P.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
F.I.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
B.M.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
M.A	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
A.C.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
Control group										
T.B.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
C.S.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
E.H.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
T.M	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.
B.L	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.	Neg.

Discussions

Analyzing the progress of the patients, we found that the treatment applied was beneficial, and the final results support this aspect as follows:

The results of the VAS, measured through palpation of the affected structures (ligaments and muscles), show a reduction in pain after 12 therapy sessions applied to each patient. Subjects R.P., A.C., and F.I. initially reported more intense pain during palpation, rated 8 and 9 on the piriformis muscle, while patients B.M. and M.A. rated it as 7. Also, during palpation of the lumbar quadratus and paravertebral muscles, subjects M.A. and A.C. reported pain intensity of 8. It can be seen from table 2 that, at the end of the intervention, the subjects' condition improved, with pain now rated between 1 and 2, described as a slight discomfort that does not interfere with daily activities. When palpating the ligaments, the pain was less intense than at the muscle level, with all patients reporting values between 4 and 6, and after the treatment was completed, these were reduced to 1 or 2. In the control group, the results obtained from palpation of the muscles and ligaments were lower, thus, from the exacerbated pain marked by the subjects as 8 and 9 on the VAS for muscles and values between 4 and 6 for ligaments, there was a slight decrease in intensity, with 4-6 for muscles and 2-4 for ligaments. However, these relatively favorable results can be attributed to muscle decontracting, due to the application of electrotherapy with anti-inflammatory and antalgic effects.

Results of the joint assessment.

Subject R.P. initially showed limitation in all directions of movement, more pronounced in flexion (63°), left lateral flexion (15°), and right rotation (17°). At the final evaluation, due to muscle relaxation and pain reduction, all values improved as follows: flexion by 12°, extension by 5°, right and left lateral flexion by 9°, right rotation by 8°, and left rotation by 7°.

Subject F.I., due to posterior vertebral impingements, initially presented very reduced values for extension (10°). Following the applied treatment, an improvement in range of motion was observed: 20° in flexion, 8° in extension, 7° in right lateral flexion, left lateral flexion, and right rotation, and 6° in left rotation.

Subject B.M. also showed positive evolution, with increased mobility of the thoracolumbar spine due to the reduction of symptoms specific to the condition, as follows: 10° in flexion, extension, and left rotation, 7° in lateral flexion and right rotation, and 6° in left lateral flexion.

Patient M.A. initially presented limitations in all directions of movement, more accentuated in flexion (68°), left lateral flexion (15°), and left rotation (20°). At the final test, due to the application of myofascial techniques and reduction in pain, all values improved: flexion by 7°, extension by 10°, lateral flexions and rotations by 10° each.

Subject A.C. showed, at the end of the intervention, an increase in range of motion of 10° in extension, 10° in right lateral flexion, 11° in left lateral flexion, and 10–11° in rotation movements.

Subject T.B. initially presented limitations in all directions of movement, more pronounced in flexion (60°), left lateral flexion (15°), and right rotation (18°). At the final evaluation, following the application of classical massage, the values were as follows: flexion improved by 8°, extension by 3°, right lateral flexion by 3°, left lateral flexion by 5°, right rotation by 4°, and left rotation by 3°. These extremely small values are insignificant for evaluation.

Subject C.S. initially had flexion at 50°, extension at 10°, right lateral flexion at 15°, left at 13°, right rotation at 15°, and left at 17°. Following the massage treatment, an improvement in range of motion was noted: 5° in both flexion and extension, 3° in right lateral flexion, 6° in left lateral flexion, and 5° in both right and left rotation.

Subject E.H. also showed slight improvement in thoracolumbar spine mobility, as follows: 6° in flexion, 2° in extension, 6° in right lateral flexion, 4° in left lateral flexion, 5° in right rotation, and 4° in left rotation.

Subject T.M. achieved improvements of 7° in flexion, 8° in extension, 10° in right lateral flexion, 9° in left lateral flexion, 7° in right rotation, and 10° in left rotation.

Patient B.L. showed an increase in range of motion due to the reduction of periarticular pain, with 10° in flexion, 8° in extension, 10° in right lateral flexion, 9° in left lateral flexion, 7° in right rotation, and 10° in left rotation.

Results of the lumbar spine mobility tests. Analyzing the group of subjects, Table no. 7 shows an improvement in lumbar spine mobility in all patients by a few centimeters. Due to the variety of tests applied, as well as the results obtained, we will proceed with an individual analysis, as follows: overall, there was an increase in range of motion in the sagittal plane by 13.8 cm, in the frontal plane to the right by 11.2 cm, and to the left by 9.6 cm. The difference recorded in the "sternum-wall index" was 5 cm, in the Schober test 4 cm, and in the Stibor test 3.2 cm.

In the control group, the differences were smaller compared to the experimental group, as follows: in the sagittal plane a difference of 8 cm was recorded, in the frontal plane to the right 3.6 cm, to the left 4 cm, in the "sternum-wall index" 2.4 cm, and in both the Schober and Stibor tests 2.4 cm.

Specific tests for detecting radicular inflammation. Table 9 presents the results of the tests indicating radicular inflammation. The "red flags" were identified (asterisks) in lumbar pain through detailed anamnesis and specific tests.

The emphasis was on the following aspects:

- Whether the pain worsens when maintaining the upright (orthostatic) position for 30 minutes,
- Each time we followed up with the patient, we asked: How is the upright position? Has anything changed? (Feedback was positive – I can maintain the upright position for a longer period)
- The disorder is neuromusculoskeletal in nature;
- Does the problem have a mechanical component? Does it appear related to muscles, nerves, or joints?
- Is it aggravated by posture, movement, or activity?
- How exactly is it aggravated?
- We must determine the nature of the issue. For example: is it inflammatory? Mechanical? Due to overuse?
- Is the patient expressive about the pain? If the symptoms are inflammatory, we must be cautious in choosing treatment methods.
- What is the stage of the disorder over time – acute, subacute, or chronic?
- Do the symptoms improve, worsen, or remain unchanged throughout treatment?
- If the pain worsens with movement, the cause is mechanical.
- If the pain is variable – sometimes worse, sometimes better – the symptoms may have a mechanical component, but if the pain is constant, there may

be an inflammatory component.

- The depth of the pain is important. Joint pain is felt deeply, while radiating pain is often described as more superficial or closer to the skin.
- Thus, it was found that at both the initial and final evaluations, the subjects were not in an acute phase and did not present with exacerbated pain.

By conducting a comparative analysis of the two subject samples—experimental and control—it can be observed that the results obtained were better in the experimental group due to the application of myofascial massage, deep tissue massage, and myotensive techniques. Lumbar dysfunction is characterized by deep core weakness and hyperactivity of superficial muscles, including the erector spinae. In contrast, myofascial techniques act directly on muscles and soft tissues, thus reducing resting activity in the paraspinal muscles of the lumbosacral spine. In this study, myofascial release therapy applied to the lower lumbar segment can directly improve lumbar mobility (Chen, Chai, Shau, Wang, & Wang, 2016; Claus, Hides, Moseley, & Hodges, 2018).

4. Conclusions

The experimental group showed better positive effects than the control group through the additional application of the antalgic electrotherapy treatment, therapeutic massage, and complementary techniques, thus contributing to pain reduction, reduction of muscle contractions, myofascial trigger points, improvement of trophicity and activation of blood circulation, improvement of range of motion, and prevention of reflex antalgic positions.

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