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Myofascial Techniques as a Part of the Treatment of Nonspecific Low Back Pain

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Abstract: Preliminary clinical study for patients with Nonspecific low back pain. *The aim* of the study is to present techniques for myofascial treatment and to determine their effectiveness in patients with nonspecific low back pain (NSLBP). *Methodology*: Myofascial treatment techniques are presented combined with specific fascial exercises and their effectiveness is estimated in 25 patients with nonspecific low back pain. Outcome measures include assessment of pain intensity by Visual Analogue Scale (VAS), Slump test, discriminatory sensibility and mobility test. All patients were assessed prior to the start of the therapy and at the follow-up at the 1st month. *Results*: Myofascial therapy combined with specific exercises produced statistically significant improvement in both pain and function in our patients suffering from nonspecific low back pain. *Conclusions:* The outcomes confirm the effectiveness of the techniques and they could be successfully implemented as a part of existing physiotherapeutic programs for patients with nonspecific low back pain. Due to the short follow up, we suggest considering the data as preliminary findings and further research is needed.

Keywords: Low Back Pain, Myofascial Treatment, Tests of Spinal Mobility

1. Introduction

Low back pain (LBP) is one of the most common complaints among the active population. About 80 percent of adult experience low back pain at some point in their life. Low back pain has become an increasing problem around the world. [5]

It is the most common cause of job-related disability and a leading contributor to missed work days. In a large survey, more than a quarter of adults reported experiencing low back pain during the past 3 months. [12]

The back is a structure composed of various elements – vertebras, discs, joints, muscles, ligaments, fascia and nerves.

Many factors may underlie a reason of back pain, from disc injury to psychological issues to tissue changes that occur over time.

The cultural, social, and political environment of back pain can influence the perception of pain, the disability created, and the use of health care. [9]

Low back pain is a symptomatic syndrome that refers to pain in any part of the back from the rib cage to the buttocks, with or without low limb discomfort.

According to its etiology, LBP can be divided into: Non-specific low back pain (NSLBP), which refers to low back pain whose exact structural changes can be found and others whose etiology cannot be determined through objective examination. [18]

Myofascial pain is one of the factors for LBP common non-particular local musculoskeletal pain syndrome caused by myofascial trigger points located at muscle, fascia, or tendons, insertions, affecting up to 95% of people with chronic pain disorders. Clinically, myofascial pain syndrome can be presented as a painful restricted range of motion, stiffness, referred pain patterns, and autonomic dysfunction. The underlying cause is often related to muscular imbalances, and following thorough physical examination the condition should be treated with a comprehensive rehabilitation program. [10]

Nowadays low back pain is treated mainly with analgesics. The causes of NSLBP are rarely addressed. Alternative treatments include physical therapy, rehabilitation and spinal

manipulation. Disc surgery remains the last option when all other strategies have failed, but the outcomes are disappointing. [13]

Studies have shown that one of the causes of low back pain is the limited function of the back and deep trunk muscles caused by changes in the structure of the fascia. [3, 20]

In recent decades, the idea that fascia — thick connective tissue that covers, organizes, and supports all the muscles, bones, tendons, ligaments and organs of the body — may be the source of back pain has been investigated with piqued interest by scientists and lay practitioners alike.

Meta-analysis showed that one of techniques for fascia treatment - MFR (Myofascial Release) can improve the effect of physical therapy alone and exercise therapy alone, and that MFR can be an effective adjuvant therapy. [4]

The physiological effect of MFT (MFR) on the relief of pain intensity in patients may be related to the removal of the obstruction of the deep fascia and surrounding muscle fibres. [11]

The technique has potential benefits in promoting fluid circulation in and around tissues, strengthening the venous and lymphatic systems, and clearing areas of fluid deposition.

New knowledge of anatomy of fascia can recognize a multilayered myofascial and aponeurotic structure whose characteristics change according to its location. [3, 6, 19] The fascial system interpenetrates and surrounds all organs, muscles, bones and nerve fibres, endowing the body with a functional structure, and providing an environment that enables all body systems to operate in an integrated manner. This is the broadest definition of the fascia. [19]

The concept of a continuum of the collagen and connective structure, the cellular diversity that makes up the fascia, is emphasized. It is this continuum itself that assures the health of the body. These scientific definitions allow healthcare practitioners to make some deductions about the fascia. [2]

The ability of the fascia to respond to changes in the external and internal environment make it a tool for the treatment of dysfunctions in the body.

The reasons to look for possible effect of treatment of fascia are discovered of different receptors of fascia which could make changes in it. These improvements might influence directly the muscle function and indirectly the information sent to the Central Nerve System (CNS) [17] The reaction of the body leads to mechanical and functional changes. [7]

Appling MFT could change damaged tissue, because different studies show that after treatment hyaluronic acid turns on condition that allow gliding between different tissue layers. It's important to reduce inflammation. [4, 15] After MFT muscles are worked appropriately and restore their function like strength and endurance.

The most famous and known fascial structure of the back is the thoracolumbar fascia (TLF). This structure has been proposed to represent a possible source of idiopathic low back pain in last decade. [6] The TLF has an essential role in the transfer of loads between the trunk and extremities and help to maintain the stability of the lumbosacral area. New research of anatomy is recognized one superficial fascia (related with the hypodermis), three layers of deep fasciae (related with the locomotor system) and various internal fasciae (related with the internal organs). The superficial fascia envelopes the superficial vessels and nerves and is richly innervated. The superficial fascia is connected to the skin (retinaculum cutis superficialis) and to the deep fascia (retinaculum cutis profundus) by fibrous septa, forming a three-dimensional network between the fat lobules of the hypodermis. This network provides a dynamic anchor of the skin to underlying tissues and permits a flexible and yet resistant mechanism of transmission of mechanical loads from multi-directional forces. The Deep Fascia: in the trunk, the deep (or muscular) fascia is organized in three different layers. The superficial layer invests the trapezius, the latissimus dorsi, the gluteus maximus, the pectoralis major, the oblique external muscle and includes the posterior layer of the thoracolumbar fascia This myofascial layer plays a key role in the coordination between trunk and extremities and in the spiral movements The intermediate layer is formed by the rhomboid and the serratus posterior muscles with their fascia. Distally this complex fuses with the inner aspect of the posterior layer of the thoracolumbar fascia. Anteriorly it continues with the serratus anterior fascia and then with the clavi pectoral fascia. This myofascial layer allows a perfect plane of gliding between the superficial muscles and to the deeper muscles and it connects all the muscles involved in the scapular stability.

The deep layer includes the anterior or middle layer, in the three layers model [19], layer of the thoracolumbar fascia, the erector spinae muscles, the transversus abdominis and oblique internal muscles. This deep myofascial layer has an important role in posture and weight bearing.

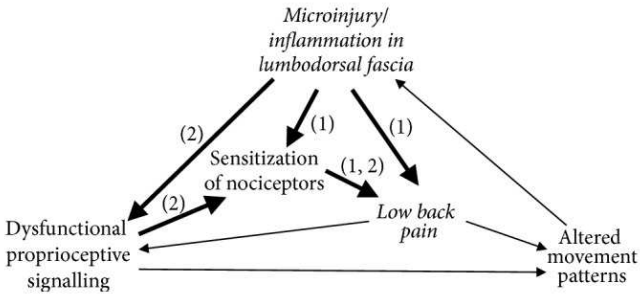

Figure 1. *The current literature supports a potential nociceptivefunction of LF in the aetiology of low back pain. This is graph rep-resents two of several possible scenarios in respective cases of fasciagenerated low back pain. (1) Microinjuries and/or inflammation andresulting irritation of nociceptive nerve endings in lumbar fascia may directly induce back pain, accompanied with a sensitization offascial nociceptors. In a second pathway (2) tissue deformation dueto injury and/or immobility may impair proprioceptive signalling. This induces a sensitization of fascial nociceptors wide, which thenalters the functioning of related polymodal neurons in the spinalcord to respond more strongly to potential nociceptive signalling, even to gentle stimulation. Combinations of both pathways are of course also possible. Figure partially based on Langevin & Sherman [1].*

The fascial anatomy permits a change of perspective, suggesting that when a patient complains low back or pelvic pain, It Is important to investigate if there are also other

symptoms or problems associated. The severity and the timing of appearance of the various pains can help to understand what is the main problem of that patients and what are the compensations. Surely, only a global treatment of all the problems of that patients, accordingly with the fascial continuity, can permit a complete and durable result.

The main goals of Myofascial treatment (MFT) are to reduce pain, improve soft tissue flexibility due to spasm and tension, increase mobility and posture, thereby, leading to improved functional capacity, better ability to perform activities of daily life, and prevention of work loss.

2. Methodology

The study included 25 individuals (15 male and 10 female), aged between 40-53 years, all suffered from low back pain. Their complains persists more than three months. Patients with neurological symptoms were excluded from the study. All individuals were followed up for 1 month, and tests were provided before the start of the therapy, and at the follow-up at 1-st month.

For assessment of the functional status were used: Assessment of pain intensity by Visual Analogue Scale (VAS), Slump test, discriminatory sensibility and mobility test (Ott, Schober).

The myofascial release technique was applied once a week. Therapy sessions follow a pattern to locating the areas of the fascia that appear to be restricted, and measuring the level of loss of motion or loss of symmetry in the body. Subsequent treatment sessions be conducted every week. The specific releases generally includes gentle application of pressure or sustained low load stretch to the affected area. Progress is gauged by the level of increased motion or function experienced, and/or decrease in pain felt by the patient. Manual technique: Area of treatment: Centre of coordination; Instrument: elbow (70%), knuckle (28%), fingertips (2%). Target tissue: Deep fascia, epimysium; Movement: 80% compression, 20% sliding; Type of pain: Intense, needle-like, can refer elsewhere.

A home-based exercise program was instructed by the physiotherapist to each patient. In addition, a written exercise program was given to the patients. The exercise program lasted for one month and was performed at least five days per week. During the program patient had to apply the next rules:

1) Do not force the body into difficult or painful positions - stretching should be pain free. Hold stretches long enough (15 to 30 seconds) to adequately lengthen muscles and improve range of motion.
2) Repeat a stretch between 2 and 5 times.

3. Results

The VAS scores after the therapy were significantly lower compared to pre-therapy scores and the differences between pre-therapy and at one month post-therapy were found to be significant (prior-VAS 5-30%; VAS 4-43%; VAS 3-27%; after VAS 3-35%; VAS 2-30%; VAS 0-35%. Subjects demonstrated a significant improvement in mobility tests: Ott –prior 1,84sm after-2,34sm; Schober-prior-1,48sm; after-1,58sm; discriminatory sensibility-prior 98%; after-77%). Slump test was negative preceding and the end of study.

Table 1. *Results of mobility tests.*

Test	Start	after 1 month
Ott	1.84 sm ± 3,00 sm	2.304 sm ± 2,56 sm
Schober	1.48 sm ± 1,36 sm	1.58 sm ± 2,19 sm

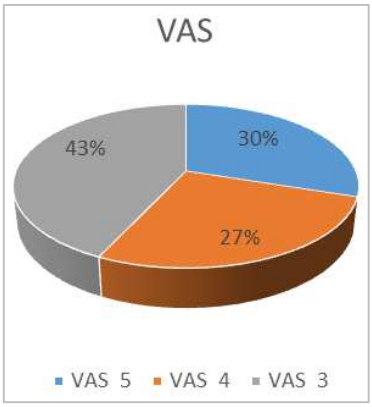

Figure 2. *Results of VAS – pretreatment.*

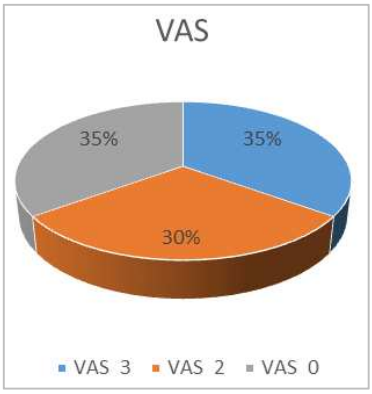

Figure 3. *Results of VAS – 1 month.*

4. Conclusions

Myofascial therapy combined with specific exercise is effective way for treatment of low back pain, applied in our study, produced significant improvement in both pain and function in our patient suffering of nonspecific low back pain. [1]

The right choice of techniques, the area of application of MFT and the regular exercises are an important condition for the effectiveness of the treatment. Despite that available data point towards a significant role of the TLF in low back pain, further studies are needed to better understand neurophysiological dynamics The connection of TLF with the other fascia of the body and the awareness of the body as an integrative system will contribute to a more complete and quality treatment of NSLBP. Due to the small size and short follow up, we suggest considering this data as preliminary findings/and further research are needed.

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