



The Low Back Pain - Looking For a Physiotherapeutic Approach

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Abstract

BACKGROUND: Low back pain (LBP) is one of the most common neurological complaints. It affects young people but has a slow progression even at a later age. LBP is a condition with a rich clinical picture – pain, severely limited range of motion in the spinal column (especially in the area of the L4-L5 segment) and sacro-iliac joints, difficulty walking. Physiotherapy has an essential role in maintaining the general condition and improving the quality of life for this contingent of patients.

AIM: The aim of the present study is to create and approve a physiotherapy methodology for pain reduction in patients diagnosed by a neurologist – radiculitis of the lumbo-sacral plexus.

METHODS: 20 clinically proven patients divided into two groups were included in the study. After signing informed consent declarations and assessment of anthropometric data (age, height, and weight), the subjects were evaluated with neurological tests such as Lasegue test and dolorimetry. Results were also reported on the Barthel index scale.

RESULTS: The dynamics of dolorimetry results, quality of life, and mobility in the spine area (especially the lumbar segment) were monitored in the two studied groups, with the results in the experimental group demonstrating better values ($p < 0.0001$).

CONCLUSION: There is no unified system for pain reduction in patients with LBP. As a result of applied physiotherapy, including modern techniques for myofascial massage, a faster increase in joint mobility in the area of the spine and sacroiliac joints, an improvement in muscle strength and, above all, a reduction in pain symptoms were found.

Edited by: Ksenija Bogoeva-Kostovska
Citation: Nikolovska L, Filipova M, Mitova E. The Low Back Pain - Looking For a Physiotherapeutic Approach. Open Access Maced J Med Sci. 2024 Jul 20; 12(3):Ahead of print. https://doi.org/10.3889/oamjms.2024.11920
Keywords: Low back pain; Physiotherapy; Quality of life
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Received: 02-May-2024
Revised: 21-May-2024
Accepted: 07-Jun-2024
Ahead of print: 20-Jul-2024
Copyright: © 2024 Lenche Nikolovska, Mariela Filipova, Ekaterina Mitova
Funding: This research did not receive any financial support
Competing Interests: The authors have declared that no competing interests exist
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Introduction

Low back pain (LBP) is one of the most common complaints of neurologically ill patients. A team of authors are looking for therapy options by differentiating the different types of pathologies in the lower back. According to their study, lower back pain encompasses a spectrum of different types of pain that often overlaps. The individual structures that make up the lumbar spine are susceptible to different types of stress, and each part, alone or in combination, can contribute to LBP. Prevention of LBP is a major challenge for patients of all age groups. By reducing pain in these patients, the high costs of health care, especially for physical therapy, will also be reduced.

To a large extent, according to the authors, therapy depends on the classification of the pain and usually begins with drug therapy in combination with physical therapy and, above all, psychological treatment in suitable patients. For refractory LBP, the authors recommend a wide range of nonsurgical and surgical therapies (e.g., decompression for neuropathic pain, disc replacement, and fusion for mechanical causes). Although it is a health, social and economic challenge, LBP is a problem for the solution of which diagnostic and therapeutic aspects are used and sought [1].

Other authors define LBP, usually, as non-specific or mechanical. Mechanical pain in the spine most often arises from its structures – the intervertebral discs, soft tissues, and nerve structures. Clinical “clues” or “red flags” can help identify cases of non-mechanical LBP. The authors advise, in such a case, to undertake further evaluation preferably by imaging to avoid omissions. “Red flags,” according to the authors, include long-term and progressive motor or sensory loss, incontinence, a history of cancer, a recent invasive spinal procedure, trauma to the spine, and more. Imaging studies from the initial examination should be preserved for comparison in cases of cauda equina syndrome, malignancy, fractures, infections, and others.

On the imaging side, plain radiography of the lumbar spine is suitable for evaluating fractures and bony abnormalities, while magnetic resonance imaging is a better option for identifying the source of neurological or soft tissue abnormalities. According to the author's team, there are numerous methods of treating mechanical LBP, but convincing evidence for treatment and recovery in patients is often lacking.

The use of medications prescribed by a doctor such as non-steroidal anti-inflammatory drugs, opioids or muscle relaxants can have a short-term effect on mechanical LBP as a treatment. There is little or unclear evidence, according to the authors, for the benefit of

acetaminophen or antidepressants, lidocaine patches, and electrotherapy (TENS) in the treatment of chronic LBP. Various spinal manipulative techniques (manual therapy) have shown mixed benefits in acute and chronic pain symptoms. Physiotherapy techniques, such as the McKenzie technique, can reduce the recurrence of LBP.

Educating patients about prognosis and incorporating psychosocial components of care, such as identifying psychological barriers to treatment, are important and essential components of long-term pain relief [2]. The author team in 2019 conducted a large-scale meta-analysis of data sources in medical research and publication platforms – CINAHL, MEDLINE, SPORTDiscus, and others. The authors study randomized controlled but clinical studies with the application of kinesiotherapy in adult patients with non-specific chronic LBP.

The authors report is that of all 9543 studies, only 89 studies (with a total number of patients = 5578) met the requirements for quality analysis (Network meta-analysis) and in 70 of the studied patients had pain, in 63 have physical capacity, 16 have mental health problems, and 4 have reduced muscle strength. The authors report the results only with a test (surface under the cumulative ranking [SUCRA]). The authors specify that when using pilates, there is a hundred percent pain reduction (SUCRA = 100%). Eighty percent reduction was available when exercising against resistance (SUCRA = 80%). Eighty percent reduction (SUCRA = 80%) was again available when stabilization/control exercises were introduced to patients. When physical activity exercises were introduced, there was again an 80% reduction (SUCRA = 80%). The authors reported that McKenzie exercises did not correct pain, and no reliable results were reported ($p > 0.095$; SUCRA $< 40\%$). The conclusion reached by the author's collective is that there is evidence for an effect on pain with Pilates, resistance exercises, and aerobic exercise training [3].

The authors tracked metadata published up to July 31, 2018, in electronic, primarily medical databases. Data from Visual Analog Scales and the Oswestry Disability Index were extracted as a selected test battery to visualize the results. The conclusions, after the conducted research, are that Kinesio taping can be a new, easy, and convenient choice for LBP intervention. The authors make a recommendation to investigate the efficacy of Kinesio taping through a clinical application to prove the possibility of treating LBP [4]. Another team of authors suggests a successful therapy of LBP with a balance cushion [5]. A researcher concluded that exercise resulted in a significant reduction in pain and a characteristic that suggests that exercise alone may play a major role in reducing chronic pain in LBP. The author is of the opinion that procedures such as acupuncture, hydrotherapy, lumbostats, magnets, TENS, traction, ultrasound, Pilates therapy, Feldenkrais therapy, Alexander technique, and craniosacral therapy are either of questionable effect or ineffective and should

therefore not be considered. The author recommends that outside of primary care, a multidisciplinary approach to functional recovery is effective. Although there are now effective and quality options for the therapy of chronic LBP, the problem of chronic LBP is still not solved. Regardless of the treatment options, no noticeable improvements in the condition of patients are available. Available evidence suggests that typical chronic LBP patients remain with some residual pain [6].

The authors conducted an interesting and critical review using discourse analysis of 66 articles retrieved from databases, mainly PubMed and Web of Science. The results suggest that many important factors such as interpersonal or institutional relationships, cultural considerations, ethical and social aspects of health are not included in physiotherapy research and practice when working with people with LBP. When using the biopsychosocial model with LBP patients, physical therapists focus narrowly and only on the biological aspects of the model. Social and wider aspects such as cultural, interpersonal, and institutional dynamics are neglected.

In examining the meta data, the author team described a lack of research conceptualizing exactly how physical therapy implements the biopsychosocial model in research and practice [7]. Researchers are also looking into treatment and rehabilitation options for patients with lumbar spine pain (especially with a herniated disc) through physical therapy. The authors reviewed randomized trials of the use of the McKenzie technique and mobilization techniques.

To reduce pain symptoms, the therapy is supplemented with cryotherapy, electrotherapy and non-steroidal anti-inflammatory drugs, analgesics, and/or muscle relaxants. The strength endurance of the back and abdominal muscles is also taken into account. From the reviewed and studied literature sources, we came to the conclusion that there is no unified system of therapy for patients with LBP [8]. Some authors recommend the use of a combination of soft tissue manipulations for pain reduction [9].

The aim of the present study is to create and approve a physiotherapy methodology for pain reduction in patients diagnosed by a neurologist – radiculitis of the lumbo-sacral plexus. The results are registered with traditional qualitative neurological tests: Lasegue test, dolorimetry, and Barthel index.

Methods

Twenty clinically proven patients divided into two groups participated in the study: Eleven patients in experimental group (EG) and nine in control group (CG). After signing declarations of informed consent and

assessment of anthropometric data (age, height, and weight), the subjects were evaluated with neurological tests such as Lasegue test and dolorimetry. Results were also reported on the Barthel index scale. Physiotherapy was carried out in the subacute period of the disease. In the acute period, patients undergo only drug treatment prescribed by a neurologist. The EG of patients were treated with kinesiotherapeutic methodology including myofascial massage, passive, active and isometric exercises, coordination and balance exercises, and locomotor exercises. In the CG, the studied contingent of patients was treated with standard kinesiotherapy, but myofascial massage was not included in the kinesiotherapeutic procedure. A 2-week course of kinesiotherapy was conducted, including a total of 10 procedures, with a duration of the procedure of 40 min. A statistical package with Prizm 3.0 was used for the statistical processing of the data and their graphical presentation (non-parametric Kruskal–Wallis statistic test and one-way analysis of variance [ANOVA]).

Results

The dynamics of the dolorimetry results in the two studied groups were monitored, and the results are tabulated in Table 1. According to the dolorimetry data, the values of the results in the EG in the initial period and after 2 weeks of kinesiotherapy (with a weekend break), i.e., a total of 10 procedures, reported a significant reduction in pain symptoms, in the EG even after the first 3 procedures.

Table 1: The dynamics of the dolorimetry results in the two studied groups (at the beginning of the therapy and after 10 procedures)

| Dolorimetry experimental and control group | |
|--|------------------------|
| Kruskal–Wallis test | |
| p-value | p < 0.0001 |
| Exact or approximate p-value? | Gaussian approximation |
| p-value summary | *** |
| Do the medians vary significantly (p < 0.05) | Yes |
| Number of groups | 4 |
| Kruskal–Wallis statistic | 36,75 |

Improvement was also present in the CG, but the data reported a smaller dolorimetry value. In terms of improving the volume of movement through the Laseg test, we report a significant improvement. The achieved improvement in the volume of movement in the spinal column has similar indicators to the authors Zlatkov *et al.* [10]. Considering the better results in the EG (p < 0.0001) is due, in our opinion, to the inclusion of myofascial massage as part of the kinesiotherapy program (Table 2).

Table 2: Examination by Lasegue test in EG (at the beginning and at the end of therapy)

| Lasegue test Mann–Whitney test | |
|---|------------------------|
| p-value | p < 0.0001 |
| Exact or approximate p-value? | Gaussian approximation |
| p-value summary | *** |
| Are medians significantly different? (p < 0.05) | Yes |
| One- or two-tailed P value? | One-tailed |
| Mann–Whitney U | 4,400 |

In the CG, there is also a change in the indicators, but they are of smaller values (p < 0.0111) - Table 3.

Table 3: Lasegue test in control group

| Lasegue test Mann–Whitney test | |
|---|------------------------|
| p-value | 0,0111 |
| Exact or approximate p-value? | Gaussian approximation |
| p-value summary | * |
| Are medians significantly different? (p < 0.05) | Yes |
| One- or two-tailed p-value? | One-tailed |
| Sum of ranks in column A, B | 178, 388 |

The results compared in the two groups demonstrated a statistically significant difference determined by one-way ANOVA (p < 0.0001). Regarding the quality of life determined by the Barthel index, a significant improvement in the results of patients in the EG (p < 0.0001) and less significant results of patients in the CG was reported. We believe that the selected components of the kinesiotherapy program support the recovery of patients with LBP. Regarding the quality of life in both groups – EG and KG, the results changed after the 4th procedure of applied kinesiotherapy.

Discussion

From the reviewed literature, there were no unified methods for therapy in patients with LBP. It is very important to note, in our opinion, the stage at which therapy is administered. In the acute period, it is appropriate for the patient to only receive medical treatment to reduce the inflamed structures, reduce the increased tone in the back muscles, and reduce the pain symptoms. In the subacute period, it is appropriate to introduce myofascial massage, manual therapy, electrotherapy, treatment by position, active exercises for abdominal and back muscles, exercises for flexing the spine, postisometric relaxation, and mobilization of the nervous system. In the chronic stage, it is appropriate to include extension procedures, hydrotherapy, electrotherapy, and resistance exercises.

Conclusion

As a result of applied kinesiotherapy, including modern kinesiotherapeutic techniques for myofascial

massage, a faster increase in joint mobility in the area of the sacroiliac joints, improvement of muscle strength for the respective muscle groups, as well as reduction of pain symptoms and improvement of locomotion were found.

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