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Methods & protocols

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McKenzie Method in Physiotherapy (Diagnosis and Mechanical Therapy): Application of Logical Clinical Reasoning and Systematic Review

Método McKenzie na Fisioterapia (Diagnóstico e Terapia Mecânica): Aplicação de Raciocínio Clínico Lógico e Revisão Sistemática

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RESUMO | INTRODUÇÃO: O método McKenzie utilizado em distúrbios da coluna vertebral, baseia-se na possibilidade de redução ou abolição da dor a partir do uso de movimentos, com preferência de direcionamento, reeducação e autocorreção de padrões posturais, mobilizações e manipulações articulares, com ajustes de mobiliário quando necessário. **OBJETIVO:** Apresentar os fundamentos gerais do método, bem como resultados de ensaios clínicos randomizados publicados na última década. **MÉTODOS:** Estudo de aplicação de raciocínio clínico lógico baseado em uma revisão sistemática da literatura. **RESULTADOS:** É necessária avaliação inicial para analisar características da dor e classificar pacientes como tendo: Síndrome Postural, Síndrome da Disfunção ou Síndrome do Desarranjo. Ao identificar o movimento que minimiza a dor, o mesmo é selecionado para principiar o tratamento. Indicam-se duas séries de 10 – 15 repetições, sustentadas por 1 – 2 segundos, com o paciente sempre tentando alcançar a máxima amplitude de movimento. Apesar da opção primária por um determinado movimento, à medida que o paciente evolui, todos os movimentos deverão ser adicionados ao tratamento, a fim de proporcionar maior elasticidade tecidual. Para complementar, o método propõe mobilizações e manipulações articulares. **CONCLUSÃO:** Deve-se ressaltar que essa é mais uma estratégia que pode ser utilizada, mas que não consiste no "padrão ouro" de tratamento para disfunções lombares. Importantes indícios apontam que, isolada ou associada a outras técnicas, o método McKenzie possui efeitos positivos no tratamento da dor lombar.

PALAVRAS-CHAVE: Lombalgia. Fisioterapia. Condutas Terapêuticas. Método McKenzie.

ABSTRACT | INTRODUCTION: The McKenzie method used in spinal disorders is based on the possibility of reduction or abolition of pain from the use of movements, with a preference for targeting, re-education and self-correction of postural patterns, mobilizations and joint manipulations, with adjustments of furniture when necessary. **OBJECTIVE:** To present the general grounds of the method, as well as results of randomized clinical trials published in the last decade. **METHODS:** Study of the application of logical clinical reasoning based on a systematic review of the literature. **RESULTS:** Initial assessment is required to analyze pain characteristics and to classify patients as having: Postural Syndrome, Dysfunction Syndrome or Disruption Syndrome. By identifying movement that minimizes pain, it is selected to begin treatment. Two sets of 10 - 15 repetitions are indicated, sustained for 1 - 2 seconds, with the patient always trying to reach the maximum range of motion. Despite the primary choice for a particular movement, as the patient evolves, all movements should be added to the treatment in order to provide greater tissue elasticity. To complement, the method proposes mobilizations and joint manipulations. **CONCLUSION:** It should be emphasized that this is another strategy that can be used, but not the "gold standard" of treatment for lumbar dysfunctions. Significant evidence indicates that, alone or in association with other techniques, the McKenzie method has positive effects in the treatment of low back pain.

KEYWORDS: Low Back Pain. Physiotherapy. Therapeutics Appoache. McKenzie Method.

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Introduction

Low back pain has a high prevalence and incidence, affecting a working age population, which produces social and economic problems, and most people will present at least one crisis in their life, but the first time usually occurs between 20-40 years[1-3].

The prevalence and severity increase with age and with the appearance of disc hernias[4]. The goals of treatment are pain relief, improvement of function and reduction of absenteeism[3]. Physiotherapeutic treatment is generally one of the first choices for the treatment of this pain, there being a large variety of modalities that may be useful to decrease the symptoms in these patients[5].

Exercise is one of the forms of treatment that have been proposed, being a commonly prescribed intervention. Among the various modalities of therapeutic exercises, there has been a movement that recognizes the role of the McKenzie method in treating lumbar pain, based on exercises with directional preference[6]. Despite the widespread use of this method, few references can describe the clinical reasoning adopted in this method involving mechanical therapy.

The description of this clinical reasoning may help physiotherapists to include method tools in promoting pain relief in people with low back pain. The present study aimed to present a brief description of the application of the method as well as a systematic review of the last 10 years regarding its use in patients with low back pain.

Methods

This study of the therapeutic method relied on a systematic review of the literature of the last 10 years to describe the clinical reasoning adopted in the treatment of low back pain of mechanical origin.

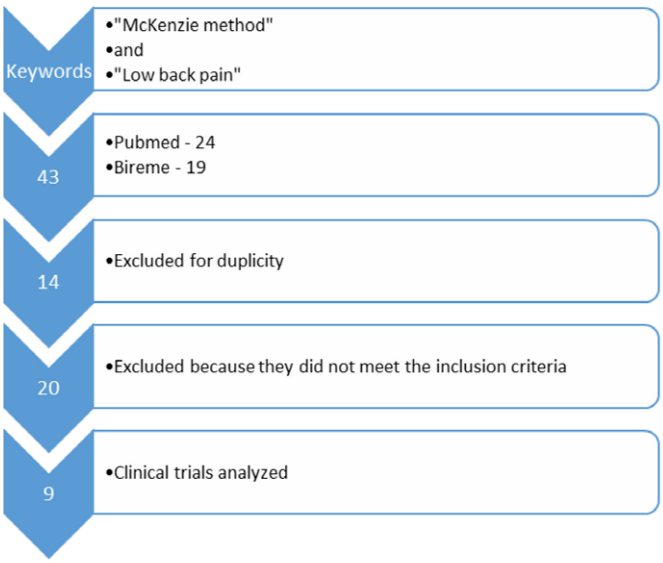
For the review were used as search terms "McKenzie Method" and "Low back pain" and its translation into Portuguese ("Método McKenzie" e "lombalgia"), in Pubmed and Bireme databases, in July 2018. Randomized, cross-sectional and / or prospective clinical trials published in the last 10 years were included, with or without active group as an intervention, analyzing the pain behavior as a primary outcome; other types of methodological design were not included, such as case studies, review, retrospective studies and lack of randomization.

Data collection was performed according to all PRISMA statement recommendations. The findings are presented in table and flow chart. From these data were outlined the objectives and procedures adopted in the method and constructed from these findings a clinical reasoning adopted in the treatment of lumbar pain of mechanical origin.

Results

With the terms presented previously, 24 articles were found in Pubmed and 19 articles in Bireme, but most did not meet the inclusion criteria, Figure 1.

Figure 1. Flowchart of the researched studies of the last 10 years (reference the month of July, 2018), to describe the clinical reasoning adopted in the treatment of low back pain of mechanical origin



Nine studies were analyzed, as they presented characteristics of randomized clinical trials, and are detailed in Table 1.

Table 1. Randomized clinical trials analyzed, from the last 10 years (reference July 2018), to describe the clinical reasoning adopted for the treatment of low back pain of mechanical origin (to be continued)

Autores	Aims	Participants	Counter-intervention	Outcomes	Results
Garcia et al. [16]	Investigation of the McKenzie method in patients with low back pain	- McKenzie (n=74) - Placebo (n=74)	Placebo (ultrasound and short waves disconnected). Both groups received written guidelines.	- Pain intensity (Scale from 0 to 10). - Disability (Roland Morris Questionnaire, Specific Functional Scale, Global Perceived Effect, Kinesiophobia Cover Scale, Expectation of Improvement). At the end of 5 weeks of treatment, 3, 6 and 12 months.	McKenzie had better results for pain, but not for disability.
,Garcia et al. [13]	Comparison of the McKenzie Method with Column School	- McKenzie (n=74) - Back School (n=74)	Back School	- pain intensity (Scale from 0 to 10). - Roland Morris Questionnaire - Range of motion - Quality of life (WHOQOL-BREF)	McKenzie obtained better results for lack of ability, but not for pain when comparing with the Back School
Halliday et al. [12]	Comparison of the McKenzie method with motor control exercises	- McKenzie (n=35) - Motor control exercises (n=35)	Motor control exercises	- Thickness of trunk muscles - Patient-specific functional range - Global perceived effect questionnaire - Visual Analog Pain Scale	McKenzie obtained better results for the perception of pain, without differences for the other variables
Machado et al. [17]	General care associated or not with the McKenzie method in patients with acute low back pain	- Basic care (n = 73) - Care + McKenzie (73)	- Guidelines and medications when needed	- Intensity of Pain (VAS) - Inability (Roland Morris Questionnaire) - Function (Patient specific functional scale) - Global perceived effect questionnaire	McKenzie scored worse than for the group that performed only basic care
Matsudaira et al. [18]	One stretch extension movement in workers at risk of developing or exacerbating low back pain	- Exercise manual + guidelines (n = 64) - Manual only (n = 72)	- Exercise manual to perform the extension movement	- Self-administered questionnaire	Extension movement is effective for control of low back pain in workers
Murtezani et al. [11]	Comparison between McKenzie and electrotherapeutic agents in patients with chronic low back pain	- McKenzie (n = 134) - Electrothermotherapy (n = 137)	- Electrothermotherapy (ultrasound, interferential and infrared)	- Intensity of Pain (VAS) - Range of motion - Disability (Oswestry)	McKenzie was more effective in reducing pain and disability than electrotherapeutic agents

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Table 1. Randomized clinical trials analyzed, from the last 10 years (reference July 2018), to describe the clinical reasoning adopted for the treatment of low back pain of mechanical origin (conclusion)

Autores	Aims	Participants	Counter-intervention	Outcomes	Results
Paatelma et al. [19]	Comparison between 2 therapy methods in patients with low back pain	- McKenzie (n = 52) - Manual therapy (n = 45) - Group orientations (n = 37)	- Manual therapy (manipulations, mobilizations, stretching techniques) - Orientations (45-60 minutes with physiotherapist)	- Intensity of Pain - Disability (Roland Morris)	The groups effectively treated were more effective
Petersen et al. [20]	Compare the McKenzie method with manipulation, associated with	- McKenzie (n = 175, 139 completed the program) - Manipulation (n = 175, 120 completed)	- chiropractic manipulation	- Roland-Morris Questionnaire - Incapacity and Pain - Global perceived effect - General health - Mental health - Lost work time - Use of medicines	McKenzie was slightly better than handling, when combined with guidelines
Szulc et al. [21]	To analyze the associated McKenzie and muscle energy methods, compared to McKenzie or conventional physiotherapy in patients with chronic low back pain	- McKenzie and muscle energy (n = 20) - McKenzie (n = 20) - Conventional treatment (n = 20)	- Conventional (massage, laser, TENS and abdominal and paravertebral strengthening exercises)	- Goniometry of column extension - Oswestry questionnaire - Visual Analog Pain Scale - Nuclear magnetic resonance	Combination therapy was the most effective, with structural improvements, functional and reduction of pain

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McKenzie method - principles

The McKenzie method - Mechanical Diagnosis and Therapy - indicated by the American Physical Therapy Association Clinical Guidelines[7] for disorders of the spine, is based on the possibility of reduction or abolition of pain from the use of movements with preference for directing, re-education and self-correction of postural patterns, mobilizations and joint manipulations and adjustments of furniture when necessary. The initial evaluation aims to collect data regarding the postures and time that the individual remains in them, during the activities of daily living (ADLs), both to study and in their professional performance[8]. This evaluation allows the analysis of whether the onset of pain originates from a sustained static dynamic load, if it is related to work ergonomics, if the pain complaint diminishes or disappears when leaving the causative posture, if the onset of pain occurs when attempting pain, if it reaches a specific maximum range of motion (ROM) or appears during any part of the arc of movement and generates functional impairment. From the data obtained in the evaluation, the patients can be classified as having: Postural Syndrome, Dysfunction Syndrome or Disruption Syndrome, called the three Mckenzie syndromes[9-11].

Postural Syndrome is identified when complaints occur by maintenance in a particular position such as: dishwashing, sitting or even lying down. The tissues are healthy and the symptoms shortly occur when releasing tension at the site, ie, change or adaptation of the posture. The treatment in this case consists of education regarding erroneous alignment (dorsal decubitus, sitting, orthostatism, gait and ADLs), ergonomics (at home or at work) and adequate body mechanics. When not addressed, this condition, in the long term, could evolve into Dysfunction Syndrome[10].

Dysfunction syndrome occurs when the soft tissues (muscles, tendons, fascia and joint capsule) are shortened and inelastic, leading to decreased joint mobility, muscle weakness, defective alignment, ie imbalance of the musculoskeletal system and the onset of functional limitations . However, movement does not trigger pain or irradiation; it is only referred to the end of certain movements. In these cases, physiotherapy already plays an important role, but in most cases the professionals are only recruited when there is worsening of the clinical picture, that is, when the Disruption Syndrome[12,13].

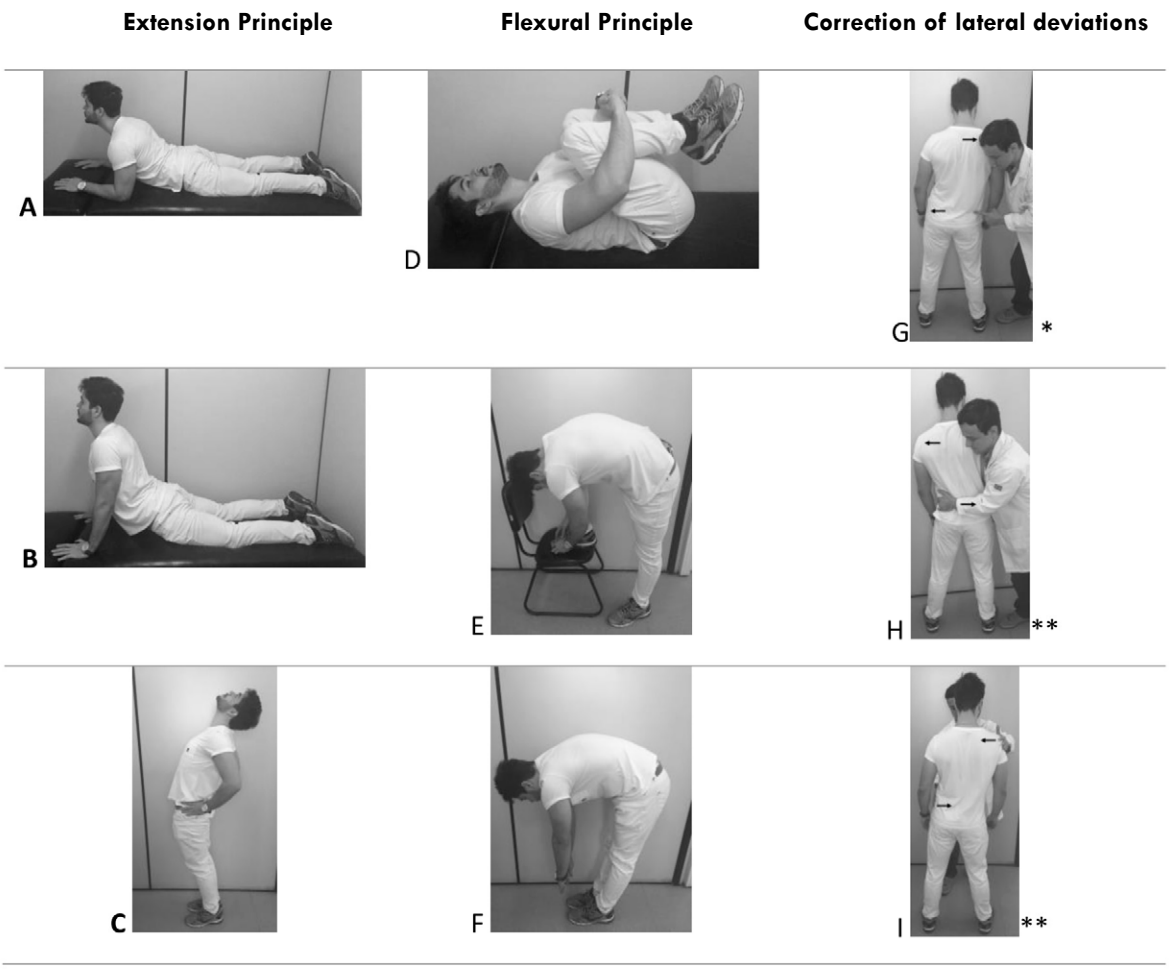
In the Disruption Syndrome the pain is constant, intense, incapacitating and sometimes irradiated, compromising the movements and aggravating the symptoms. Some changes such as thoracic hyperkinesis, scoliosis and torticollis may be present, as well as complaints of progressive stiffness, poor posture or the feeling that the cervical or lumbar spine is "out of the way". The physiotherapist will need to act in the stabilization of possible hypermobile sites, make use of manual therapy on rigid segments, hypomobiles and use the reasoning of mechanical therapy proposed by the McKenzie method[8,9].

All this information are obtained during the initial evaluation and the use of standardized form, it can help in the chronology of the evaluation, as well as, facilitate the interpretation of the data. The physical evaluation itself determines which movement provides relief (Centralization) and aggravation of the painful situation (Peripheral), dictating which "Treatment Principle" should be used, avoiding peripheralization and providing centralization or irradiation of pain 10. Symptoms are commonly tested in positions of flexion and extension on stretcher or table, as well as in orthostatism. In addition, Mckenzie proposes the use of lateral gliding, as biomechanical summation of tilt and rotation movements, which are tested bilaterally with the patient in bipedal posture. Symptoms may be reported in single movement or as the patient returns for the same, for up to ten repetitions[9,11].

When identifying the movement that minimizes pain, the pain will initially be selected to begin treatment, aiming to decrease the intensity, frequency or location of pain (centralization). If it is the extension movement, it can be performed with the patient in a supine position supported on elbows, forearms and hands, evolving to extension of elbows and support only in the hands (Figure 2, Images 1A and 1B)[14]. In addition, the patient is taught how to do posture in orthostatism (Figure 2, Figure 1C)[8,12,14]. The flexion can be done with the patient in the supine position, having his knees hugged against the thorax, progressing to flexion of trunk and unilateral hip with forward support in biped position or to get the

hands to the ground in orthostatism (Figure 2, Images 1D, 1E e 1F). The lateral deviation is more used in cases of scoliosis, with the initial correction performed by the physiotherapist and later in orthostatism in front of the mirror, to enhance the ideal position of the patient (Figure 2, Images 1G, 1H and 1I)[14].

Figure 2. Principles of Treatment of the McKenzie Method

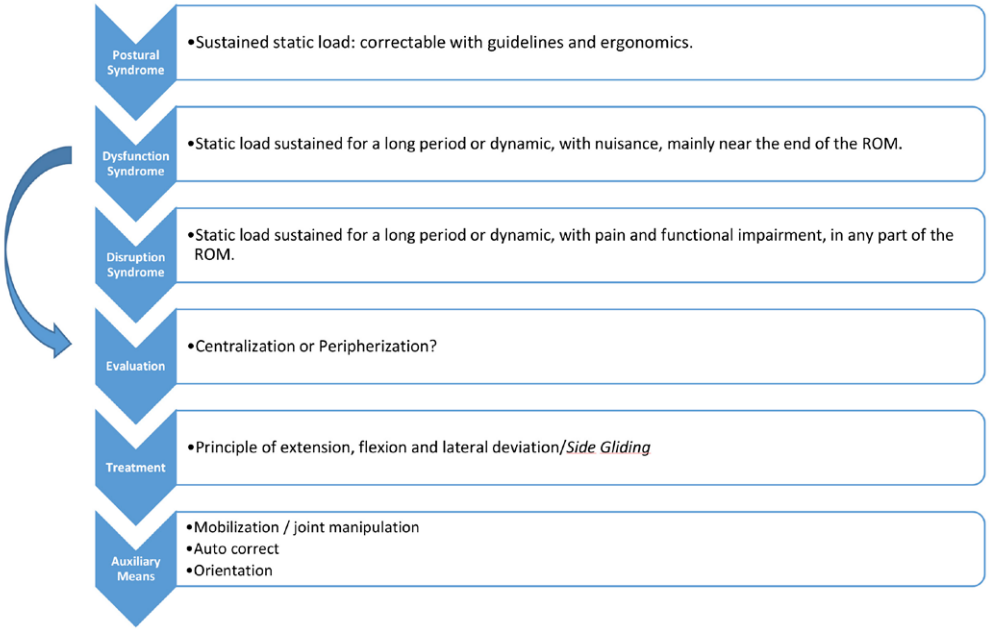


Photos: Personal Archive; *: Arrows indicate postural deviation; **: Arrows point to corrective forces.

Two series of 10-15 repetitions are indicated, sustained for 1-2 seconds, with the patient always trying to reach the maximum possible range of motion. Despite the primary option for a given movement, as the patient progresses, all movements should be added to the treatment in order to provide greater tissue elasticity[11-13].

In the face of pain and stiffness, McKenzie's method of diagnosis and mechanical therapy proposes joint mobilizations and manipulations as efficient aids. In addition, the patient should be taught about "self-correction" of postures, movements and encouraged to practice them at home and when possible at work[10,11,15]. Figure 3 presents a flow chart on the rationalization of the method proposal.

Figure 3. Fluxogram - logical reasoning of the McKenzie method of Diagnosis and Treatment



Discussion

This study sought to support the scientific literature to develop the clinical rationale of a therapeutic method for the treatment of low back pain of mechanical origin. Of the studies analyzed, only one presented a comparison of the McKenzie method with a placebo group[16], other 4 presented comparisons with general orientations (including back school)[13,17-19], 4 studies compared with manual therapy or exercises[12,19,20] and in one of them the McKenzie method was applied in association with muscle-energy or electrotherapeutic treatment[21], and in another study compared with electrotherapy[11]. In general, recent studies have indicated that there were better results for the treatment performed or the McKenzie method or when it was associated with some other therapeutic form, and no important adverse effects of this modality were seen.

The meager evidence on the Mckenzie method indicates that clarification is needed about the size of the effect in the treatment of low back pain[8-12]. However, this is not the only condition in which the method is employed and may be used for treatment of both the axial and appendicular skeleton, with satisfactory clinical results regarding the ability to self-manage the symptoms and function[22-25].

The clinical reasoning adopted serves as a basis for the decision-making of physiotherapists during the selection of techniques and behaviors to be applied in people with low back pain. It should be emphasized, however, that this is another strategy that can be used, but it is not the "gold standard" of treatment for low back pain, and its results are described as similar or superior to other interventions, but it depends of the counter-intervention established in the comparison[10,11]. Moreover, this feature provides reduction of pain and disability in chronic cases, which does not replicate in the same way in acute situations[26]. Therefore, it is an interesting "tool", but the physiotherapist will determine how best to apply it and not a sine qua non of care. It should be noted as limitations of the systematic review that only two databases have been used, as well as the cut of the last 10 years has been used, which can compromise with respect to the amount of manuscripts on the subject.

Conclusion

There are important indications that, alone or in association with other techniques, the McKenzie method has positive effects in the treatment of low back pain. It should be emphasized that this is another

strategy that can be used, but it is not the "gold standard" of treatment for lumbar dysfunctions, mainly comparative studies with different forms of therapy are necessary.

Contributions of authors

Artioli DP participated in the conception of the study and production of the text. Bertolini GRF participated in the conception of the study and critical review of the manuscript.

Conflicts of interest

No financial, legal or political conflict involving third parties (government, business and private foundations, etc.) was declared for any aspect of the work submitted (including but not limited to grants and funding, advisory board, study design, manuscript preparation , statistical analysis, etc.).

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