

Therapy with physical exercises for low back pain*

Terapia com exercício físico na dor lombar

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ABSTRACT

BACKGROUND AND OBJECTIVES: Low back pain is a common disease in several industrialized countries, being a public health and incapacity problem, especially among economically active people. This study aimed at grouping and updating knowledge about motor control exercises for low back pain.

CONTENTS: Cochrane, Medline (Pubmed) and PEDro databases were queried in the period from 2000 to 2010, using the keywords *low back pain, stabilization, multifidus, transversus, exercise* and *training*. Six randomized clinical trials were found, which have shown that such exercises may be indicated for acute low back pain to prevent recurrences, in addition to their indication to decrease chronic low back pain and incapacity.

CONCLUSION: Motor control exercises do not improve pain and incapacity in acute cases, but are effective for chronic cases to relieve pain, decrease incapacities and improve quality of life.

Keywords: Low back pain, Physical therapy modalities, Stabilization.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor lombar é uma doença comum em diversos países industrializados, constituindo-se em problema de saúde pública e incapacidade, principalmente para a população economicamente ativa. O objetivo deste estudo foi agrupar e atualizar conhecimentos em relação aos exercícios de controle motor na dor lombar.

CONTEÚDO: Foi realizada revisão da literatura nas bases de dados Cochrane, Medline (Pubmed) e PEDro, no período

de 2000 a 2010, utilizando os descritores *low back pain, stabilization, multifidus, transversus, exercise* e *training*. Foram encontrados seis ensaios clínicos aleatorizados, que demonstraram que esses exercícios podem ser indicados na dor lombar aguda como forma de prevenção de recidivas, e indicações para sua aplicação na redução da dor e incapacidade na dor lombar crônica.

CONCLUSÃO: Os exercícios de controle motor não melhoram a dor e incapacidades nos casos agudos, porém são eficazes nos casos crônicos a fim de aliviar o quadro algico, reduzir incapacidades e melhorar a qualidade de vida.

Descritores: Dor lombar, Estabilização, Modalidades de fisioterapia.

INTRODUCTION

Low back pain (LBP) is common in industrialized societies, being a public health and incapacity problem, especially for the economically active population^{1,2}. Some data state that 70 to 85% of the population has LBP during life and 80% of them have recurrence³. Several pathologic conditions may induce LBP; however most of them have no defined cause and are called idiopathic LBP¹.

When there is LBP recurrence and it becomes chronic, specific muscles such as multifidus and transversus abdominis have their transverse section area decreased and activation time delay⁴⁻⁶. Among physical interventions, physiotherapy stands out due to the richness of therapeutic modalities, such as kinesis, hydrotherapy, electrothermal and phototherapy, relaxation, massotherapy, acupuncture and others⁷, which may be used to treat both acute and chronic LBP.

Within this context, some researchers⁸ have developed a lumbar motor control exercises (MCE) program with the objective of reacquiring control of body muscles, especially deep muscles (transversus abdominis, lumbar multifidus and pelvic floor muscles) improving spinal mechanical support⁹.

Some studies have been carried out to prove the efficacy of the MCE program to treat LBP in different populations^{10,11}. So, it is necessary to summarize such studies through a review, to evaluate possible evidences of the applicability of such intervention in subjects with different occupations and acute or chronic LBP. This study aimed at grouping and updating knowledge, through literature review, of physical exercise therapy using motor control exercises technique, as alternative to treat low back pain.

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CONTENTS

This is a descriptive and retrospective research by means of literature review. Cochrane, Medline (Pubmed) and PEDro databases were queried from 2000 to 2010.

To select articles, the descriptor *low back pain* was crossed with the following keywords: *stabilization, multifidus, transversus, exercise and training*, based on Health Science Descriptors (DeCS) and on Medical Subject Headings (MeSH).

Inclusion criteria were: randomized clinical trials investigating MCE effect alone or as part of LBP management; which have evaluated at least one pain outcome, incapacity and/or quality of life; written in Portuguese, Spanish or English; available free and in full in some electronic site; and published between January 2000 and December 2010.

Review articles, updates, case reports and experience reports were excluded.

Studies content was qualitatively analyzed and data were presented in a table with description of the following characteristics: authors, sample, type of intervention and results.

RESULTS

We have found 102 articles during the selected period, and only studies in full addressing the application of MCE for LBP were selected (Figure 1). Six randomized clinical trials published about the subject during the evaluated period were identified and are summarized in table 1.

Among the studies, one has included acute LBP patients, another has included sub-acute LBP patients and four have included chronic LBP patients. Sample size of included studies

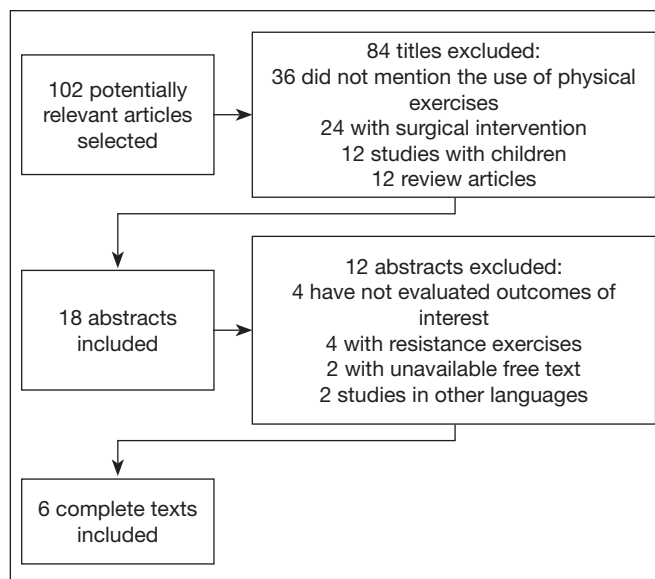


Figure 1. Articles selection strategy flowchart.

has varied from 39 to 204 patients and in total, 388 individuals were evaluated by selected articles.

All clinical trials have compared two groups. Only one study has used control group, three studies have compared MCE to conventional or surgical medical interventions and two articles have compared MCE protocol to other physiotherapeutic interventions.

Selected studies have indicated limited efficacy of MCE protocol for acute LBP in the short term, and consistent results of its application to decrease chronic LBP pain and incapacity.

Table 1. Characteristics of included randomized clinical trials on MCE for low back pain

Authors	Sample	Type of intervention	Results
Shaughnessy & Caulfield ¹¹	41 patients with chronic LBP	G1: MCE G2: no intervention Time: 10 weeks	Significant improvement in incapacity and quality of life (p<0.01) for G1
Brox et al. ¹⁵	64 patients with chronic LBP or disk injury	G1: cognitive therapy + MCE + aerobic exercises G2: spinal fusion surgery Time: 5 weeks	With no significant difference in pain and incapacity improvement (ODI) (p=0.33) 12 months after
Niemisto et al. ¹⁴	204 patients with LBP with or without irradiation	G1: MCE + manual therapy + medical visit G2: medical visit Time: 4 weeks	With no significant difference in pain and incapacity improvement (Oswestry) Significant pain and incapacity improvement for G1 (p<0.001, p=0.002) 5 and 12 months after
Rasmussen-Barr, Nilsson-Wikmar & Arvidsson ¹⁰	47 patients with sub-acute, chronic or recurrent LBP with or without irradiation	G1: MCE G2: Manual therapy Time: 6 weeks	With no significant difference in pain, incapacity (Oswestry) Significant capacity improvement (DRI) (p<0.04) for G1
Moseley ¹⁶	57 patients with chronic LBP with or without irradiation	G1: home MCE + manual therapy + education G2: medical visit Time: 4 weeks	Significant pain and incapacity improvement for G1 (p<0.01)
Hides, Jull & Richardson ¹³	39 patients with acute LBP with or without irradiation	G1: MCE + medical treatment G2: medical treatment (rest, medical leave, analgesics) Time: 4 weeks	With no significant difference in pain and incapacity 4 weeks later. Decreased recurrence in G1 one year later (p<0.001) and 2 and 3 years later: (p<0.01)

G1: Group 1; G2: Group 2; MCE: motor control exercises; LBP: low back pain; Oswestry: Oswestry functional index; DRI: disability rating index.

DISCUSSION

This review has identified, based on evaluated studies, that MCEs do not seem to be more effective to decrease acute LBP pain and incapacity as compared to medical treatment. A study¹² confirms such findings because it has indicated that therapeutic exercises are not more effective as compared to other active (flexion) or inactive (rest or placebo) treatments to improve acute LBP clinical symptoms. However, MCEs are effective for the recovery of the transverse section area of multifidus muscles in the short⁵ and long term¹³, and do decrease the level of recurrence.

Among selected studies, one has compared the efficacy of MCE to manual therapy (stretching, traction, soft tissues mobilization)¹⁴. At the short, medium and long term there have been no significant differences among groups in pain and general health evaluation. So, it was observed that an MCE program was not more effective to decrease pain and improve general health of individuals with sub-acute and chronic LBP in the short, medium and long term, as compared to manual therapy. Incapacity was evaluated by Oswestry and DIR (disability index rating) questionnaires. At the short, medium and long term, MCEs were more effective than manual therapy to decrease incapacity when evaluated by the DIR questionnaire, but not when evaluated by the Oswestry questionnaire¹⁴.

A study has compared MCEs to no treatment, with positive results in decreasing pain and incapacity and improving QL of the MCE group soon after intervention, which may be considered a limiting factor for the evidences that MCE would be more effective than no treatment to improve pain, incapacity and QL in cases of chronic LBP.

MCEs as part of a treatment program were included in two studies which have evaluated the efficacy of such exercises as part of the treatment of individuals with chronic LBP^{15,16}. Two studies have compared an approach including MCE, manual therapy and education with physician consultation to treat chronic LBP^{14,16}. Only one study has evaluated short term results¹⁶. Soon after treatment, there has been more pain and incapacity improvement in the MCE group. In the short term, it was not possible to confirm that MCEs associated to manual therapy and education would be more effective than just physician consultation to decrease pain and incapacity in chronic LBP individuals.

Only one study¹⁴ has evaluated medium term results, without significant difference between groups, because they have presented significant improvement in pain, function and QL. Authors have concluded that MCEs associated to manual therapy and physician consultation were not more effective than physician consultation to improve pain, incapacity and QL in the medium term for chronic LBP patients. In the long term, however, there has been significant difference between groups in two studies^{13,15}, with positive results in pain and incapacity improvement for MCE groups. These studies have shown improvement with the association of MCEs, manual therapy and physician consultation, as compared to physician consultation alone, for pain and incapacity outcomes in the

long term, for chronic LBP patients.

A study included in this review has compared the efficacy of MCE and cognitive therapy to lumbar fusion surgery to treat chronic LBP¹⁵. Both groups had similar pain and incapacity improvement and there has been no significant difference between groups in one year outcome. So, in the long term, it is observed that MCEs and cognitive therapy were not as effective as a surgical approach to decrease pain and incapacity of chronic LBP.

As to studies on MCE for sub-acute and chronic LBP which have tested this type of exercise with other physiotherapeutic intervention, only one study has compared the technique to manual therapy (stretching, traction, soft tissues mobilization) during six weeks, applying DIR and Oswestry questionnaires to evaluate pain and incapacity¹⁰. There has been significant incapacity improvement (DIR) without difference between interventions.

The literature has some indication that MCEs implemented as part of a treatment program including manual therapy and education, or associated only to manual therapy, are more effective as compared to medical treatment for chronic LBP. Such findings are also in line with previous findings of a systematic review¹². However, further studies with more comprehensive reviews and adequate meta-analysis to the intended outcome are needed to prove that therapeutic exercises are more effective than usual medical approach to treat chronic LBP.

CONCLUSION

Based on this study, one may conclude that therapies with physical exercises, by means of motor control exercises, may be indicated as part of low back pain treatment for acute LBP patients to prevent recurrences, and for chronic LBP patients aiming at improving pain, function and quality of life. They may also be prescribed as treatment alternative, after surgical procedures for chronic LBP patients.

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