

Primary, Secondary and Tertiary Prevention of Low Back Pain: Role of Exercise Therapy

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Abstract

This short communication aimed at re-exploring the evidence for exercise therapy in primary, secondary and tertiary prevention of low back pain (LBP) from an evidence-informed overview of published studies indexed in PubMed. There were five clinical trials, two systematic reviews, one guideline and two narrative reviews, all of them concluding in favor of exercise therapy administered as part of a multidisciplinary program. The effects of exercises were biological, psychological and social, and a regular aerobic exercise program can improve strength and endurance, prevent fatigue from causing improper body mechanics, increase beta-endorphin levels, reduce depression and give patients an overall feeling of well-being in people with LBP.

Keywords: Preventive rehabilitation; Prophylactic exercises; Preventive exercises; Spinal pain.

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Clinical trials

Soukup *et al*[1] studied the long-term effects of Mensendieck exercise programme (exercises and ergonomical education) on 77 people with

recurrent episodes of low back pain who participated in their randomized controlled clinical trial where the subjects received 20 group sessions of exercises and ergonomical education over 13 weeks. The control subjects were not offered any prophylactic therapy, but were free to receive treatment or exercises. Mensendieck group had significant reduction in number of subjects experiencing recurrent low back pain than those in the control group at 3-years follow-up.

Rackwitz *et al*[2] studied 100 nurses to examine the participants' ability to learn Segmental stabilizing exercises (SSE) for specific dysfunction of local muscles (m. transversus abdominis, m. multifidus, pelvic floor muscles and diaphragm pelvis), and their response as LBP reduction. The authors found that 72% of participants were able to perform

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SSE correctly as measured by the prone test post-intervention. Participants also reported exercising SSE for 12 min on average 4-5 days a week. SSE was thus effective both for primary and secondary prevention of LBP among nurses.

Wessels *et al*[3] studied the factors determining reductions of “interference” in a multidisciplinary and an exercise prevention program for low back pain using the data from a randomized controlled clinical trial on 162 participants. They found that reductions of interference at post-measurement were explained best by reductions of pain intensity and catastrophizing which suggested physical and psychological mechanisms of exercise in the efficacy of multidisciplinary prevention program.

Ewert *et al*[4] compared multimodal, secondary prevention program (MP) versus general physical exercise program (EP) alone, in 169 nurses with chronic low back pain (LBP) where MP consisted of 17 group sessions of 1.75 hours and one individual session of 45 minutes, also including 5 psychological units, 7 segmental stabilization exercises units, and 8 ergonomic and workplace-specific units; and EP consisted of 11 group sessions, each lasting 1 hour subsequently followed by sessions that included general physical strengthening and stretching exercises as well as instructions for a home-training program. There were no between-group differences except for 12-month pain interference effect size which was larger for MP group compared to EP group.

Suni *et al*[5] administered a 6-month neuromuscular exercise (control of their lumbar neutral zone and specifically to avoid full lumbar flexion in all daily tasks) and counseling program and studied its effectiveness for reducing the incidence of low back pain (LBP) and disability in 690 young healthy military conscripts. Decreased total number and incidence of off-duty days due to LBP were reported in intervention companies compared with controls which suggested that exercises have a prophylactic effect on LPB-related off-duty service days in the military environment when implemented as part of military service

among young healthy men.

Systematic reviews

Bell and Burnett[6] analyzed 15 controlled trials to examine the effectiveness of exercises in decreasing LBP incidence, LBP intensity and the impact of LBP and disability. The authors found strong evidence for exercise in reducing the severity and activity interference from LBP. Only limited evidence for preventive role of exercises was found since the methodological quality of studies was poor and studies had conflicting results. Only two high quality trials showed significant reductions in LBP intensity with exercise. The inappropriate reporting of use of combinations of exercise, study populations, participant presentation, workloads and outcome measures; levels of exercise adherence and a lack of reporting on effect sizes, adverse effects, and types of subgroups, created heterogeneity that limited definitive conclusions on the efficacy of workplace exercise in preventing LBP.

Choi *et al*[7] searched CENTRAL, MEDLINE, EMBASE and CINAHL and investigated the effectiveness of exercises in reducing recurrences of back pain and found four studies with 407 participants evaluated post-treatment programmes and five studies with 1113 participants that evaluated exercise as a treatment modality. There was moderate evidence for post-treatment exercises than no intervention for reducing the rate of recurrences at one year.

Guidelines

Agency for Health Care Policy Research established the treatment guidelines for acute low back pain in which beneficial effects of rehabilitation and conditioning exercises in patients with low back pain was recommended.[8]

Narrative reviews

About 40% of cases with acute low back pain develop chronicity and burdensome disability

both emotionally and financially to individual sufferers, loved ones, employers, and the health care system. Hence treatments aimed at reducing risk of chronic pain such as exercises would be beneficial and desirable. [9] A regular aerobic exercise program can improve strength and endurance, prevent fatigue from causing improper body mechanics, increase beta-endorphin levels, reduce depression and give patients an overall feeling of well-being. [10]

There were five clinical trials, two systematic reviews, one guideline and two narrative reviews, all of them concluding in favor of exercise therapy administered as part of a multidisciplinary program. The multidimensional effects of exercises were biological, psychological and social.

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