NO.
02
2016

Science & News

redcord® MEDICAL

G. Lorimer Moseley and David S. Butler. Fifteen Years of Explaining Pain: The Past, Present, and Future. The Journal of Pain 2015;16(9):807-13

Summary:
This article summarizes what Explaining Pain (EP) is all about. It also takes the reader through the historical aspects and common misconceptions related to EP. Based on current knowledge, the authors propose future directions to enhance the effects of EP.

Abstract:
The pain field has been advocating for some time for the importance of teaching people how to live well with pain. Perhaps some, and maybe even for many, we might again consider the possibility that we can help people live well without pain. Explaining Pain (EP) refers to a range of educational interventions that aim to change one's understanding of the biological processes that are thought to underpin pain as a mechanism to reduce pain itself. It draws on educational psychology, in particular conceptual change strategies, to help patients understand current thought in pain biology. The core objective of the EP approach to treatment is to shift one's conceptualization of pain from that of a marker of tissue damage or disease to that of a marker of the perceived need to protect body tissue. Here, we describe the historical context and beginnings of EP, suggesting that it is a pragmatic application of the biopsychosocial model of pain, but differentiating it from cognitive behavioral therapy and educational components of early multidisciplinary pain management programs. We attempt to address common misconceptions of EP that have emerged over the last 15 years, highlighting that EP is not behavioral or cognitive advice, nor does it deny the potential contribution of peripheral nociceptive signals to pain. We contend that EP is grounded in strong theoretical frameworks, that its targeted effects are biologically plausible, and that available behavioral evidence is supportive. We update available meta-analyses with results of a systematic review of recent contributions to the field and propose future directions by which we might enhance the effects of EP as part of multimodal pain rehabilitation.

Perspective: EP is a range of educational interventions. EP is grounded in conceptual change and instructional design theory. It increases knowledge of pain-related biology, decreases catastrophizing, and imparts short-term reductions in pain and disability. It presents the biological information that justifies a biopsychosocial approach to rehabilitation.

Haik MN et al. Effectiveness of physical therapy treatment of clearly defined subacromial pain: a systematic review of randomised controlled trials. Br J Sports Med doi:10.1136/bjsports-2015-095771

Summary:
This article is a systematic review that summarizes the current evidence related to the effectiveness of physical therapy on subacromial pain. The conclusion is that exercise therapy should be the first-line treatment to improve pain, function and range of motion.

Abstract:
Aim To summarise the current evidence regarding the effectiveness of physical therapy on pain, function and range of motion in individuals with subacromial pain syndrome (SAPS).

Design Systematic review.

Data sources PubMed, Web of Science, CINAHL, Cochrane, Embase, Lilacs, Ibecs and Scielo databases.

Eligibility criteria for selecting studies Randomised controlled trials (RCTs) investigating physical therapy modalities for SAPS on pain, function/disability or range of motion were included.

Results 64 high-quality RCTs were included. Exercise therapy provided high evidence of being as effective as surgery intervention and better than no treatment or placebo treatment to improve pain, function and range of motion in the short, mid and long terms. The combination of mobilisation and exercises provided high evidence to decrease pain and improve function in the short term. There is limited evidence for improvements on the outcomes with the isolated application of manual therapy. High level of evidence was synthesised regarding the lack of beneficial effects of physical resources such as low-level laser, ultrasound and pulsed electromagnetic field (PEMF) on pain, function or range of motion in the treatment of SAPS. There is limited evidence for microwave diathermy and transcutaneous electrical nerve stimulation. There is moderate evidence to no benefits with taping in the short term. Effects of diacutaneous fibrolysis and acupuncture are not well established yet.

Conclusions Exercise therapy should be the first-line treatment to improve pain, function and range of motion. The addition of mobilisations to exercises may accelerate reduction of pain in the short term. Low-level laser therapy, PEMF and taping should not be recommended.

Boucher JA et al. The Effects of Vibration and Muscle Fatigue on Trunk Sensorimotor Control in Low Back Pain Patients. PLOS ONE doi:10.1371/journal.pone.0135838

Summary: The findings in this study demonstrate that local muscle vibration leads to significant trunk neuromuscular control improvements in chronic low back pain (cLBP) patients, and thus could be considered in the treatment of cLBP.

Abstract:
INTRODUCTION: Changes in sensorimotor function and increased trunk muscle fatigability have been identified in patients with chronic low back pain (cLBP). This study assessed the control of trunk force production in conditions with and without local erector spinae muscle vibration and evaluated the influence of muscle fatigue on trunk sensorimotor control.

METHODS: Twenty non-specific cLBP patients and 20 healthy participants were asked to perform submaximal isometric trunk extension torque with and without local vibration stimulation, before and after a trunk extensor muscle fatigue protocol. Constant error (CE), variable error (VE) as well as absolute error (AE) in peak torque were computed and compared across conditions. Trunk extensor muscle activation during isometric contractions and during the fatigue protocol was measured using surface electromyography (sEMG).

RESULTS: Force reproduction accuracy of the trunk was significantly lower in the patient group (CE = 9.81 ± 2.23 Nm; AE = 18.16 ± 3.97 Nm) than in healthy participants (CE = 4.44 ± 1.68 Nm; AE = 12.23 ± 2.44 Nm). Local erector spinae vibration induced a significant reduction in CE (4.33 ± 2.14 Nm) and AE (13.71 ± 3.45 Nm) mean scores in the patient group. Healthy participants conversely showed a significant increase in CE (8.17 ± 2.10 Nm) and AE (16.29 ± 2.82 Nm) mean scores under vibration conditions. The fatigue protocol induced erector spinae muscle fatigue as illustrated by a significant decrease in sEMG median time-frequency slopes. Following the fatigue protocol, patients with cLBP showed significant decrease in sEMG root mean square activity at L4-5 level and responded in similar manner with and without vibration stimulation in regard to CE mean scores.

CONCLUSIONS: Patients with cLBP have a less accurate force reproduction sense than healthy participants. Local muscle vibration led to significant trunk neuromuscular control improvements in the cLBP patients before and after a muscle fatigue protocol. Muscle vibration stimulation during motor control exercises is likely to influence motor adaptation and could be considered in the treatment of cLBP. Further work is needed to clearly identify at what levels of the sensorimotor system these gains are achievable.

Bae CH et al. The Effect of Sling Exercise on Muscular Strength and Range of Motion in Female Patients who Received Total Knee Replacement. Journal of the Korea Academia-Industrial Cooperation Society 2014;15(7):4395-403

Summary: The results of this study show that sling exercise increases muscle strength and range of motion significantly better than the control intervention in patients with total knee replacement.

Abstract:
The purpose of study was to compare the effectiveness of sling exercise on the muscle strength and range of motion in female patients who received a total knee replacement. The participants were allocated randomly into 2 groups: sling exercise group (n=15) and control group (n=15). The subjects were evaluated using the Biodex system for the muscle strength test and a goniometer for the range of motion test. The data was analyzed using a paired t-test and independent t-test to determine the statistical significance. As a result, the sling exercise group before and after intervention showed a statistical significance difference in the flexion angle, quadriceps femoris, and hamstring muscle strength. The control group before and after the intervention revealed a statistically significant increase in the flexion & extension angle, quadriceps femoris, and hamstring muscle strength. Muscle strength test and flexion range of motion test in the sling exercise group showed statistical significance differences compared to the control group ($p<.05$). Therefore, the sling exercise group has a positive influence on the muscle strength and ROM in patients with a total knee replacement.