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INDIVIDUAL PATIENT RESPONDER ANALYSIS OF THE EFFECTIVENESS OF A PAIN NEUROSCIENCE EDUCATION PROGRAMME IN CHRONIC LOW BACK PAIN

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Background: Chronic low back pain (CLBP) is a common health problem to which a large number of types of treatments seem to produce similar mean improvement in patient's symptoms. Individual responder analyses offer the possibility of providing patients and clinicians with supplementary information about the chance of achieving particular degrees of pain relief, which may improve the decision-making process as well as communication with patients.

Purpose: To examine the effectiveness of a combined programme of pain neuroscience education and aquatic exercise (EDU+EXE) versus aquatic exercise alone (EXE) in pain intensity in CLBP patients, and to determine the time course of response in pain intensity and the time course of effectiveness for clinically significant improvements.

Methods: A single blind randomized trial, was conducted in patients with CLBP lasting >3 months. The EDU+EXE group (n=30) received 2 sessions of pain neuroscience education followed by 12 sessions of a 6-week aquatic exercise programme, whereas the EXE group (n=32) received 12 sessions of the aquatic exercise programme alone. Patients were assessed at baseline, 3 and 6 weeks after the beginning of the aquatic exercise programme and then at a 12 weeks follow-up. The primary outcome was pain intensity (Visual Analogue Scale). Clinically significant treatment response was defined as a pain relief over baseline of >50%.

Results: Analysis using mixed-model ANOVA revealed a significant treatment condition interaction on pain intensity at the 3 months follow-up, favouring the EDU+EXE group (mean SD change: -25.4±26.7 vs -6.6±30.7, $p<0.005$). At patient-level response, there were differences in the response rates and patterns. In the EDU+EXE group, the proportion of patients that experienced substantial pain relief (>50%) raised from 47% to 70%, at 3 and 12 weeks, respectively. In the EXE group this proportion raised from 25% to 34% (Relative risk of 1.87, and 2.04 respectively). At 3 weeks, 41% of the participants in the EXE group achieved a level of response of "no important change" (<15%) compared to 27% in the EDU+EXE group. In the EDU+EXE group, and for those who achieved a pain relief of at least 50% at 3 weeks, the rate of sustained pain relief response was approximately 93% and 86%, at 6 and 12 weeks respectively. These rates were higher than those of 63% and 50% found in the EXE group.

Conclusion: This study's findings support the provision of pain neuroscience education as a clinically effective addition to aquatic exercise. Individual response analysis showed that the patients receiving EDU+EXE achieved an early response to pain, had higher response rates at all the endpoints and were also more likely to achieve a sustained response over time compared to those receiving EXE only.

Implications: Intervention studies should examine patient-level responses in addition to average treatment effects in order to enhance the clinical decision-making and patient communication.

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