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CASE SERIES

Can physical therapy centred on cognitive and behavioural principles improve pain self-efficacy in symptomatic lumbar isthmic spondylolisthesis? A case series



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KEYWORDS

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Summary *Purpose:* Pain-related self-efficacy is defined as “the beliefs held by people with chronic pain that were able to carry out certain activities, even when experiencing pain”, and it is considered a relevant mediator in the relationship between pain and disability in chronic low back pain. This case series describes a treatment aiming to improve pain self-efficacy in patients with symptomatic lumbar spondylolisthesis.

Method: Ten consecutive outpatients with lumbar spondylolisthesis and chronic LBP referred to a rehabilitative clinic participated in this study. Cognitive and behavioural principles were integrated with functional and graded approach in each individual physical therapy program. The outcome measures concerned clinical instability and endurance tests, pain, disability and self-efficacy.

Results: Pain self-efficacy and lumbar function improved in 7 out of 10 patients; clinical tests improved in 9 out of 10 patients.

Conclusion: A rehabilitation program carried out by a physical therapist, centred on cognitive and behavioural principles, appeared useful in improving pain self-efficacy and lumbar function. These results may be interesting for future controlled trials.

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Introduction

Spondylolisthesis (SPL) is a pathological condition caused by the slipping of a vertebral body, compared to the underlying structure, following structural and/or degenerative spinal changes.

Isthmic spondylolisthesis is present in a small subset of the adult population. Literature reports a 5% prevalence, with L5 the most common location (Vining et al., 2014).

The relation between isthmic spondylolisthesis and Low Back Pain (LBP) is unclear. Data suggests that mild-moderate spondylolisthesis detected by chance in middle-aged people does not predispose to more disabling back pain than back problems experienced by those without spondylolisthesis. However, women with spondylolisthesis have mild back symptoms more often than control subjects (Virta and Rönnemaa, 1993). Other authors consider the forward slip as possible pain generator (Jones and Rao, 2009; Fredrickson et al., 1984) and related to an increased risk for permanent low back disability (Frennered, 1994).

LBP in SPL may be attributed to an insufficient spinal stability (Fredrickson et al., 1984). According to the Bio-Psycho-Social model, chronic LBP (CLBP) may be also influenced by attitudes, beliefs and behaviours (Vlaeyen and Linton, 2000; Waddell, 2004). These factors may play a key role in recovery from chronic symptoms (Wessels et al., 2006; Hasenbring and Verbunt, 2010).

Among all psychological factors predictive of poor outcomes six months after initial consultation for LBP, poor perceptions of personal control and low confidence in the ability to perform normal activities despite the pain were fitted perfectly within the framework of the self-efficacy model (Foster et al., 2010).

Pain-related self-efficacy is defined as "the beliefs held by people with chronic pain that were able to carry out certain activities, even when experiencing pain" (Bandura, 1977; Nicholas, 2007). It may be useful to explain the association between pain and disability (Costa et al., 2011; Ferrari et al., 2015a; 2015b), since a high self-efficacy is considered the strongest predictor for reduced pain and better function (Evans et al., 2010). Pain self-efficacy is also a relevant factor for the adherence of exercise program (Medina-Mirapeix et al., 2009; Sherman et al., 2013), and its role is currently stressed in LBP treatment (Altmaier et al., 1993; Roberts et al., 2015).

More specifically, when inadequate illness perceptions are present, specific education is indicated (Nijs et al., 2011), to improve the patient's ability in successfully exerting pain control (Vancleef and Peters, 2011). Some studies demonstrated that identifying a patient's maladaptive beliefs and, at the same time, satisfying their need for information and improving their health status is effective in CLBP (Hill et al., 2008; Glattacker et al., 2012; Steiner et al., 2013; Monticone et al., 2014).

Furthermore, statistically significant improvements on pain intensity and disability have been demonstrated following graded exercises and graded exposures (Kernan and Rainville, 2007; George et al., 2010). A graded-exercise intervention emphasizing stabilizing exercises for working patients with non-specific recurrent LBP also

seemed to improve physical health (Rasmussen-Barr et al., 2009).

Integration between active exercise measures, psychological treatment and consideration of the so-called yellow flags has been suggested (Koes et al., 2006; Nelson and Churilla, 2015) and this clinical approach has been recommended in a recent Guideline (Delitto et al., 2012). Cognitive Functional Therapy is a behaviourally targeted intervention that combines normalization of movement and abolition of pain behaviours with cognitive reconceptualization of the CLBP problem while targeting psychosocial and lifestyle barriers to recovery. Following this intervention, statistically significant reductions in functional disability and pain were observed and depression, anxiety, back beliefs, fear of physical activity, catastrophizing, and self-efficacy were significantly improved (O'Sullivan et al., 2015).

We can assume that patients with chronic symptomatic lumbar SPL may hold maladaptive beliefs regarding their specific spinal condition (kinesiophobia, catastrophization or activity avoidance) as well as patients with non-specific CLBP. At the best of the authors' knowledge, no study based on the Cognitive Functional Therapy intervention in subjects with symptomatic lumbar SPL has been published. The purpose of this case series was to show a model of physical therapy treatment aimed to improve pain self-efficacy in chronic SPL patients and to display possible relationships between clinical changes, pain and disability.

Case description

Patients. Ten consecutive outpatients, aged from 23 to 48 years, diagnosed by a spinal surgeon through Magnetic Resonance Imaging (MRI) as having symptomatic isthmic L5-S1 SPL and referred to a rehabilitative clinic were consecutively evaluated and treated from January to July 2015. Six subjects had SPL grade I and four subjects had SPL grade II. Only one subject had pain radiating below the knee.

Inclusion criteria were: age >18 years, presence of isthmic SPL, LBP with or without leg pain lasting for at least 3 months, ability to read and speak fluently in Italian, Pain Self-Efficacy Questionnaire score less than 40. Patients were excluded if they presented non-specific LBP, other types of SPL (e.g. degenerative SPL), lumbar canal stenosis, severe specific condition (e.g. fracture, infection, tumour), central neurological signs, systemic illnesses (e.g. rheumatoid arthritis), or severe psychiatric disorders. The patients were encouraged not to take medication during the study, except for the paracetamol, if it was necessary.

Before the starting of the first session, a physical therapist gave information about the study to all eligible patients and after having received their informed consent, he submitted them a booklet to check demographics characteristics and medical history. This booklet included the Italian versions of the Numerical Rating Scale (NRS), the Pain Self-Efficacy Questionnaire (PSEQ-I) and the Oswestry Disability Index (ODI-I).

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