



PREVENTION & REHABILITATION: RANDOMISED CONTROLLED PILOT TRIAL

Adherence to home exercises in non-specific low back pain. A randomised controlled pilot trial



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Received 29 June 2014; received in revised form 20 November 2014; accepted 24 November 2014

KEYWORDS

Non-specific low back pain;
Movement control impairment;
Augmented feedback;
Adherence;
Home exercises

Summary Specific exercises for the improvement of movement control of the lumbopelvic region are well-established for patients with non-specific low back pain (NSLBP) and movement control impairment (MCI). However, a lack of adherence to home exercise regimens is often observed. The aim of the study was to explore the differences in home exercise (HE) adherence between patients who perform conventional exercises and those who exercise with Augmented Feedback (AF).

Twenty patients with NSLBP and MCI were randomly allocated into two groups. The physiotherapy group (PT group) completed conventional exercises, and the AF group exercised with an AF system that was designed for use in therapy settings. The main outcome measure was self-reported adherence to the home exercise regimen.

There was no significant difference in HE duration between the groups ($W = 64, p = 0.315$). The AF group exercised for a median of 9 min and 4 s (IQR = 3'59"), and the PT group exercised for 4 min and 19 s (IQR = 8'30").

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Exercising with AF led to HE times that were similar to those of conventional exercise, and AF might be used as an alternative therapy method for home exercise.

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Introduction

Chronic low back pain is a substantial socioeconomic problem in today's society, and 84% of the population will experience an episode of low back pain (LBP) in their lifetime (Airaksinen et al., 2006; Nachemson, 1999). Most patients recover within four weeks; however, 23% of patients develop chronic LBP (Airaksinen et al., 2006; Nachemson, 2004) that is not resolved within a year (Henschke et al., 2008; Stanton et al., 2008). Non-specific LBP (NSLBP) is diagnosed in 85% of all patients with LBP (Airaksinen et al., 2006; Van Dillen et al., 1998). A subgroup of these patients suffers from movement control impairment (MCI) of the lumbar spine according to O'Sullivan (O'sullivan, 2005). The lack of movement awareness and control of the lumbopelvic region leads to an inappropriate movement behaviour with provocative movement and posture patterns. According to previous authors, this mechanism leads to a tissue overload and mechanically provoked pain (Dankaerts et al., 2007; O'sullivan, 2005). Impairment-specific exercises for movement awareness and control of the lumbopelvic region are effective for patients with NSLBP and movement control impairment (Costa et al., 2009; Macedo et al., 2012). However, traditional exercises are often considered monotonous, which leads to discontinuation, particularly at home (Burke et al., 2009; Duncan et al., 2002; Becker, 1985). However, the effect of the therapy relies on the adherence of the patient to the performance of the exercises not only in therapy setting but also at home (Mannion et al., 2009; Van Gool et al., 2005). A previous study demonstrated that non-adherence to treatment and exercises occurs in up to 70% of all patients and consequently adversely affects treatment effectiveness and costs (Sluijs et al., 1993). The reasons for a lack of adherence to the regimen of regularly exercise might include the complexity of the movements and the lack of feedback during HE (Brodbeck et al., 2009a, 2009b; Escobar-Reina et al., 2010). Adherence is defined by the active cooperation and the attitude of the patient during the therapy session and during HE execution (Meichenbaum and Turk, 1987). Adherence can be measured through patient self-assessments, recording of the numbers of minutes spent exercising at home, or ratings of the therapist based on questionnaires. Previous studies have shown that patients exhibit a greater enthusiasm for exercise execution during training with a computer-animated Augmented Feedback (AF) system (Nitzsche and Schulz, 2011). In training movement control with Augmented Feedback, the movements are executed and controlled by the lumbar spine.

Thus far, only a moderate correlation between cooperation during therapy sessions and HE adherence has been reported (Kolt and Mcevoy, 2003). Because the level of adherence associated with AF training is not known, we investigated this association in a pilot trial.

The primary research question was the following:

1. Is there a difference in HE adherence between patients with conventional HE and patients who exercised with AF?

The secondary research questions were as follows:

2. What is the correlation between self-assessed adherence and therapist-rated adherence?
3. Does training with AF lead to different changes in self-perceived disability and lumbar movement control compared to those elicited by conventional physiotherapy?

Methods

Study design

The study was designed as a randomised controlled pilot trial. Eligible patients were recruited from October 2012 to April 2013 in Winterthur, Switzerland.

Subjects

Patients between the ages of 18–65 years were recruited at the front desk of physiotherapy practice, at a fitness studio and from a university campus via posters. The included patients had experienced NSLBP for longer than four weeks and at least moderate disability as indicated by an Oswestry disability index (ODI) > 8% (Mannion et al., 2006a,b) and exhibited low levels of biopsychosocial risk factors (STarT Back Screening tool > 4 points) (Hill et al., 2011). The patients had MCIs of at least two points according to the rating system of Luomajoki and colleagues (Luomajoki et al., 2007, 2008). Patients with specific LBP, pain in other areas of the body (e.g. neck, head, thoracic spine or arms), vertigo or equilibrium disturbances, systemic diseases (e.g. tumours and diabetes), complaints, injuries or surgeries of the legs within the last six months, medication affecting postural control and pregnancy were excluded. All patients provided written informed consent prior to the study. The trial was approved by the Ethics committee of the canton Zurich, Switzerland (KEK-ZH-Nr. 2011-0522).

Randomisation

A computer-generated randomisation was performed. The patients were randomly allocated into blocks of four, within one of two treatment arms. The randomisation was

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