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Research Article

Single or Multiple Electroacupuncture Sessions in Nonspecific Low Back Pain: Are We Low-Responders to Electroacupuncture?

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Abstract
The objective of this study was to compare the effects of one or multiple sessions of electroacupuncture (EA) in patients with chronic low back pain. The outcome measures were visual analog score (VAS), pressure pain threshold (PPT), McGill pain questionnaire (MPQ), Roland Morris disability questionnaire (RMDQ), low back skin temperature, surface electromyography of longissimus muscle (contraction/rest) and blood cytokines. After examination (AV0), patients were submitted to EA (2 Hz, 30 minutes, bilaterally at the SP6, BL23, BL31, BL32, BL33, and BL60) and were revaluated after one week (AV1). Patients with VAS <3 (VAS <3 group, $n = 20$) were directed to return after three weeks (AV2). Patients with VAS >3 (VAS >3 group, $n = 20$) were submitted to one weekly EA-treatment and revaluated after three weeks (AV2). The VAS <3 group showed a significant reduction in VAS and MPQ and increased PPT in AV1, but not in AV2. No significant differences were found in RMDQ. The VAS >3 group showed reduction in VAS and increased PPT in AV1 and a reduction in MPQ and RMDQ only in AV2. No significant differences were found in

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electromyography, temperature or cytokines. Thus, despite 2Hz-EA is effective reducing low back pain, some patients only experienced reduced pain intensity and improved functional capacity after full treatment.

1. Introduction

Low back pain (LBP) is a common musculoskeletal disorder among adults and refers to pain and discomfort localized in the lumbosacral region, with or without leg irradiation [1]. Approximately one in four people will need medical attention in a 6-month period. It is estimated that around 50% of the worldwide population will experience the first LBP approximately at the age of 30 years, whereas 70% of the population will experience LBP at one point in their adulthood [2].

Although a considerable variety of pharmacologic and nonpharmacologic therapies are available for the treatment of LBP, the effectiveness of most of these interventions is yet to be established [3].

There has been an increasing interest in acupuncture among the public as well as health professionals. It is one of the most complementary and alternative medicine modalities widely used to treat patients suffering from LBP [4]. However, there is no guidance for the time of treatment, the frequency of sessions, the number of needles needed, or placement of needle insertion. Still, there is a significant disparity in the acupuncture techniques, and there is no standardization of treatment [5].

National Institute for Clinical Excellence guidelines on LBP and sciatica highlighted the need for promotion of self-management and recommended a structured exercise program, a manual therapy, or an acupuncture treatment for 10 sessions over 12 weeks [6]. On the other hand, a report proposed not to use acupuncture for managing LBP with or without sciatica based on low-quality evidence [7].

Ushinohama et al [8] recently tested the hypothesis that a single session of ear acupuncture would be enough to reduce pain and improve balance in individuals with LBP temporarily. While a single session of ear acupuncture was effective to reduce pain intensity momentarily, it did not improve body balance.

In the present study, we tested the hypothesis that a single session of electroacupuncture (EA) in patients with chronic LBP would be sufficient to temporarily reduce pain intensity and functional disability, enhancing their muscle activation and reducing local skin temperature and blood mediators, when compared to a long-time treatment.

2. Material and methods

2.1. Study

This study was a *quasi*-experimental study approved by the Research Ethics Committee of the Federal University of Alfenas (protocol study 525.967) and financed by the National Council for Scientific and Technological Development (CNPq). All participants were properly informed regarding the objectives and procedures and signed a statement of informed consent before testing.

2.2. Patients

2.2.1. Inclusion criteria

Patients were eligible for inclusion if they were aged 30—65 years, with nonspecific chronic LBP for more than 3 months of duration and have a minimum pain intensity score of six in the visual analog score (VAS).

2.2.2. Exclusion criteria

Patients were excluded if they previously underwent surgery in the spinal column, had known or suspected serious spinal pathology, fractures, tumors, inflammatory or rheumatologic disorders of the spine, severe cardiopulmonary disease, rheumatic disease, were pregnant, had a pacemaker or metal implants, previous acupuncture treatment, or did not understand the written consent form. All participants were invited to sign the participant consent form.

2.3. Procedures

The methodology of this study was based on standards established by the Standards for Reporting Interventions in Clinical Trials of Acupuncture. The recruitment began on November 25, 2013, and the completion date was August 31, 2015. To examine the longevity of the EA intervention effects, measurements were taken before treatment after examination (AV0), after 1 week of EA treatment (AV1), and 3 weeks after the intervention (AV2). We recruited 96 patients at the Physiotherapy Clinics in Federal University of Alfenas, Minas Gerais, Brazil. After examination (AV0), fifty patients were submitted to one session of EA and were revaluated after one week (AV1). The patients were divided into two groups (Fig. 1), patients with less than three points in VAS (VAS <3 group, $n = 20$) were directed to return after 3 weeks (AV2). If the VAS score was more than three points, patients (VAS >3 group, $n = 20$) were submitted to one weekly 2 Hz EA treatment session lasting 30 minutes and revaluated after three weeks (AV2). Acupuncture points chosen were selected based on the characteristics of patients and the relevant literature [9]. The asepsis on the application sites was provided by 70% alcohol, and the skin was shaved when necessary. The EA was carried out with stainless-steel acupuncture needle, 0.25 $\times$ 30 mm (Dong Bang, China) gently inserted to depths of 0.8 to 1.5 cm coupled in the electrical stimulation device (EL 608, NKL, Brusque, Brazil) with 2 Hz for 30 minutes bilaterally at the points: SP6 (Sanyinjiao), BL23 (Shenshu), BL31 (Shangliao), BL32 (Ciliao), BL33 (Zhongliao), and BL60 (Kunlun). An experienced therapist performed the needle insertion with

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