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ORIGINAL RESEARCH

The acute effect of Bowen therapy on pressure pain thresholds and postural sway in healthy subjects

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ABSTRACT

Objective: The purpose of the study is to determine the immediate effect of Bowen Therapy in pressure pain threshold and postural sway of healthy individuals.
Design: Crossover, randomized, and double blinded study.
Setting: University.
Participants: Participants aged 18 years old or over, naïve to Bowen therapy were recruited among university students. An a priori sample size calculation determined that 34 participants were needed.
Methods: Each participant attended two sessions and received Bowen Therapy and a sham procedure. The order in which Bowen or the sham procedure were administered was randomized. All participants had their postural control and pressure pain thresholds assessed in sessions 1 and 2 both at baseline and at the end of the session.
Main outcome measurements: Postural control was assessed using a force plate and centre of pressure antero-posterior and medio-lateral displacement, velocity and total sway area were calculated. Pressure pain threshold was measured at 10 different body sites on the paraspinal muscles from C1 to S1 using an electronic algometer.
Result: The results showed a significant increase in the anteroposterior displacement ($p = 0.04$) and a significantly lower decrease in the mean velocity ($p = 0.01$) of the centre of pressure and a significant increase in the pressure pain thresholds of two (out of ten; $p \leq 0.04$) body sites in the group receiving Bowen Therapy compared to the group receiving the sham. No other significant differences were found.
Conclusions: The findings suggest that Bowen Therapy has inconsistent immediate effects on postural control and pain threshold in healthy subjects. Further studies are needed using symptomatic participants.

1. Introduction

The fascia is a continuous viscoelastic connective tissue that forms a three-dimensional net of functional collagen that supports, suspends, protects and connects muscle, skeletal, nervous, circulatory and visceral components (Tozzi et al., 2011). It is virtually inseparable from all other body structures and maintains continuity between tissues, supporting and facilitating their function (Kumka and Bonar, 2012). The connective tissue and, in particular, the fascia are richly innervated (van der Wal, 2009; Willard et al., 2012). Studies with electronic microscopy and contrast procedures have demonstrated that the fascia has both free nerve endings and encapsulated nerve endings (Benjamin, 2009; Kumka and Bonar, 2012; Willard et al., 2012) suggesting that it may have an important role in proprioception and nociception.

The fascia has been implicated in several pathologies, such as compartmental syndromes, fibromyalgia or Dupuytran contracture (Benjamin, 2009) and low back pain (Schilder et al., 2014). Changes in fascial tissue can include the formation of fibrosis and adhesions associated with immobilization or abnormal movement patterns, tissue discontinuities, chronic inflammation and/or changes in sensitivity due to neuroplastic changes of the nerve endings (Corey et al., 2011; Langevin et al., 2011; van der Wal, 2009).

Myofascial therapies are designed to free the points of tension or decreased fascial mobility, decrease pain and restore function.

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The proposed mechanisms of action are based on the plastic, viscoelastic and piezoelectric changes in fascia (Fratzl, 2008). One of the myofascial therapies is Bowen Therapy, which is a dynamic fascial and muscle release approach, consisting of gentle cross-fiber movements applied to the fascia, muscles, tendons, muscle insertions, muscle septa, ligaments and viscera (Black and Murray, 2005; Carter, 2002a,b; Duncan et al., 2011; Marr et al., 2011; Whitaker et al., 1997). The cross-fiber procedure is called the Bowen movement and is considered the active principle of Bowen Therapy. The Bowen movements are applied at specific body regions in precise sequences, separated by a 2 minute rest and aims to induce smooth fascial stretching (Black and Murray, 2005; Carter, 2002a,b; Duncan et al., 2011; Marr et al., 2011; Whitaker et al., 1997; Baker, 2013). The Bowen Therapy was developed in the 50's by Tom Bowen in Australia (Chaitow and Baker, 2014). Studies investigating the effects of Bowen Therapy are scarce. A search in Pubmed performed on January 2016 using the words "Bowen Therapy" retrieved 5 studies related to Tom Bowen's work. Among these 5 references is a systematic review (Hansen and Taylor-Piliae, 2011), which reports to have found 1 randomized clinical trial and two quasi-experimental trials. These findings highlight the need for more research investigating the effects of Bowen Therapy. For this reason we decided to conduct a double-blind, placebo-controlled and randomized crossover trial to evaluate the acute effect of Bowen Therapy on pressure pain thresholds (PPT) and on postural control in healthy individuals. A sample of healthy individuals was chosen to inform future studies on Bowen's Therapy and evaluate any potential risks related to the procedure.

2. Methods

Data was collected in the Human Movement Lab at the School of Health Sciences, Aveiro University. Each participant attended two sessions between June and July 2014, and received Bowen Therapy in one session and a placebo procedure in the other session. The study was approved by the Ethics Committee of the Social and Health Sciences Department, Faculty of Medicine, Porto University, March 2014. Before data collection, all participants gave their written informed consent.

2.1. Participants

A total of 34 healthy participants, recruited among the students at the University of Aveiro were invited to participate in the study by one of the researchers. The sample size was calculated a priori using the GPower software version 3.1 (Faul, Erdfelder, Lang, & Buchner, Kiel), based on an $\alpha = 0.05$, power of 80% and a medium effect size (0.5).

To enter the study, participants had to be 18 years old or more and naïve to Bowen Therapy. Participants were excluded if they, report pain in the cervical, dorsal or lumbar spine, spine, trunk and/or limbs surgery, major structural changes (congenital or acquired) in the spine and/or upper and lower limbs, severe postural changes, pregnancy, previous injuries in the vestibular system, uncorrected visual changes, major musculoskeletal, neurological or cardiac pathology or consumption of alcoholic beverages or other substances that may alter the balance in the 24 h prior to data collection (Fernandez-de-Las-Penas et al., 2008; Jones, 2004).

2.2. Measurement procedures

Demographic, anthropometric, PPT and postural control data were collected. Measurement procedures are specified below. Postural control measurements were performed by an assessor (the laboratory technician that operates the Nexus software version 1.8, Vicon, Oxford) and PPT measurements by another assessor (a psychology student appropriately trained by the 1st author), both were blind to the intervention, before and immediately after the intervention. Participants were not told whether they were receiving the intervention or the placebo procedure and advised not to talk about the intervention with the assessors.

2.3. Randomization and allocation concealment

Each participant attended two sessions and received Bowen Therapy in one session and a placebo procedure in the other session. The procedure received in session 1 (Bowen Therapy or placebo) was randomized using a blocked sequence of single numbers (either 1 or 2) generated using the research randomizer software (www.randomizer.org). Before generating the sequence, it was defined that number 1 would represent Bowen Therapy and number 2 the placebo procedure. Randomization was blocked so that each procedure was applied in session 1 for the same number of participants (see Fig. 1). The information on the procedure that each participant would receive was inserted into a sealed opaque envelope with the participant number written on the front (34 individual envelopes). Envelopes were prepared by a researcher not involved neither in the assessment of participants nor in the delivery of the intervention/placebo and handed to the therapist delivering it just before application of the Bowen Therapy/placebo.

2.4. Bowen therapy and placebo

Bowen Therapy consisted on the application of sequences 1, 4, 2, hamstrings (movements 1–6) and sacrum sequences in the prone position, and hamstrings sequence (7–18 movements) and 3 in the supine position, according to ISBT Bowen Therapy® (Black and Murray, 2005). This sequences included Bowen movements in the scalenes, trapezius, all erector spinae, sacro-iliac joint ligaments, gluteus maximus and medius, tensor fasciae latae, hamstrings and gastrocnemius (Black and Murray, 2005).

The placebo consisted of placing the hands on the skin on the exact same anatomical points used for the application and with the same moments of pause of Bowen Therapy, including the change of position, but without applying Bowen movement, which is considered the active principle of this technique.

The intervention (Bowen Therapy and placebo) took around 40 min to be applied. The intervention was performed by a physiotherapist with 8 years of experience, who is a certified Bowen Therapist by the International School of Bowen Therapy, and has applied Bowen Therapy in clinical practice for the last 6 years.

In session two, with a minimum interval of five days, individuals who have been applied Bowen Therapy in the first session received the placebo procedure and vice versa.

2.5. Assessment of postural control

Postural control was measured in static standing using a force plate (AMTI MSA-6). Data were collected using the Nexus software version 1.8 (Vicon, Oxford), and processed using Matlab version R2014a (MathWorks, Natick) to compute: total sway area, anteroposterior and mediolateral centre of pressure (COP) displacement and mean COP velocity. Participants were instructed to stand on the platform, barefoot, eyes closed, with both feet together, arms at their side and to remain in this position as quiet as possible for 90s. Data were collected at a frequency of 1000 Hz and measurements were repeated 3 times. Between measurements, subjects were instructed to walk around the lab for 15 s. These procedures are in line with international recommendations and aim to increase the reliability of data collection (Ruhe et al., 2010). The force platform is