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ORIGINAL RESEARCH

Kinesiology taping does not change fibularis longus latency time and postural sway



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KEYWORDS

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Summary *Background:* Kinesiology tape seems to improve muscle force, although little is known regarding its effect on latency time and postural sway.

Objectives: To examine the effects of kinesiology taping on fibularis longus latency time and postural sway in healthy subjects.

Methods: Thirty participants were equally randomized into three groups, two experimental groups receiving kinesiology tape (EG1, from origin to insertion; EG2, from insertion to origin) and a control group. Before and 20-min after the intervention, postural sway was assessed on a force platform and fibularis longus latency time was recorded with surface electromyography during a sudden inversion perturbation.

Results: At baseline, no differences were found between groups regarding age, anthropometrics variables, postural sway and fibularis longus latency time. In both experimental groups, the application of tape did not change postural sway and fibularis longus latency time (EG1: 93.7 ± 15.0 to 89.9 ± 15.6 ms; EG2, 81.24 ± 14.21 to 81.57 ± 16.64 , $p < 0.05$). Also, no changes were observed in the control group.

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Conclusion: Kinesiology tape seems not to enhance fibularis longus reaction time and postural sway in young healthy subjects.

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Introduction

Kinesiology tape is a tool widely used by physiotherapists in the prevention and treatment of musculoskeletal injuries. Supporting its use are the claims of its favourable effects on pain, inflammation, circulation and lymphatic drainage, and muscle activity (either providing inhibition or facilitation) (Bassett et al., 2010; Kase et al., 2003). Nonetheless, recent systematic reviews (Csapo and Alegre, 2014; Kalron and Bar-Sela, 2013; Morris et al., 2013; Mostafavifar et al., 2013; Williams et al., 2012) found insufficient evidence or some anecdotal support and there is still little quality evidence to support the usage of kinesiology tape for the prevention or treatment of musculoskeletal injuries.

Ankle sprain is one of the most frequent injuries in sports practice (Hootman et al., 2007), presenting also a high re-injury rate (Bahr and Bahr, 1997). Several risk factors for ankle sprain occurrence have been identified including lower postural stability and eversion strength (Witchalls et al., 2012). In this context, a number of strategies to prevent ankle sprain have been tested including ankle strengthening (Mohammadi, 2007), proprioceptive training (Hupperets et al., 2009; Mohammadi, 2007), ankle braces (Janssen et al., 2014) and non-elastic taping (Olmsted et al., 2004). Taking into account the high incidence of ankle sprains and the claims that kinesiology tape, when applied to the ankle, could change muscle activity, thus improving postural sway and muscle reaction time, it is not a surprise that some studies have addressed this issue previously (Briem et al., 2011; Shields et al., 2013). Briem et al. (2011) examined the effect of non-elastic tape and kinesiology tape on muscle activity of the fibularis longus during a sudden inversion perturbation and observed that kinesiology tape had no effect on muscle activation of the fibularis longus. Likewise, Shields et al. (2013) despite finding statistical significance for time-to-boundary measures and traditional centre of pressure (CoP) measures, concluded that due to the very small effect sizes no decisively relevant changes were observed following application of kinesiology tape to the ankle.

Relative to the small number of studies and the presence of some methodological limitations including the lack of a control group and the lack of randomization of the test order (Shields et al., 2013), the investigation about the potential of kinesiology tape to prevent ankle sprains by enhancing postural sway and muscle latency time remains inconclusive. Therefore, the purpose of the present study was to examine the effect of two kinesiology taping conditions compared to a non-tape condition on muscle activity of the fibularis longus during a sudden inversion perturbation and on postural sway in young healthy subjects. It is hypothesized that kinesiology taping could be a potential prevention strategy to mitigate the occurrence of

ankle sprains by decreasing fibularis longus latency time during a sudden inversion perturbation and postural sway in young healthy subjects.

Methods

Participants

Thirty healthy university students (15 women and 15 men; mean age 22.24 ± 2.66 years old) volunteered to participate in this study. Recruitment occurred through verbal advertisement and research posts. Subjects with 18 years of age and older, without regular sports practice (>2 times per week) and without low back/lower limb pain were recruited for this study. Subjects were excluded according to the following criteria: ankle injury in last year, ankle instability, lower limb surgery, lower limb fracture and neurologic injury in the lower limb. The study tests were performed in the dominant leg. Dominant limb was defined as the limb used to kick a ball.

The 30 participants were equally randomized into three groups, two experimental groups receiving kinesiology tape and a control group (CG: 5 women and 5 men, mean \pm SD age, 21.7 ± 2.7 years; height, 169.1 ± 9.9 cm; body weight, 71.5 ± 15.8 kg). In the first experimental group (EG1: 6 women and 4 men, mean \pm SD age, 22.4 ± 3.0 years; height, 169.7 ± 4.7 cm; body weight, 66.6 ± 8.8 kg), the kinesiology tape was applied from origin to insertion of the fibularis longus. In the second experimental group (EG2: 4 women and 6 men, mean \pm SD age, 22.6 ± 2.4 years; height, 171.5 ± 10.5 cm; body weight, 70.9 ± 17.4 kg), the kinesiology tape was applied from insertion to origin of the fibularis longus. Participant eligibility was determined through a screening questionnaire.

Prior to participation, the purpose of the study and the experimental protocol were explained to the subjects. All participants provided written informed consent and all procedures were conducted according to the Declaration of Helsinki. The subjects were familiarized with the experimental protocol and apparatus. Each subject completed all data collection in one session.

Procedures

The participants reported to the laboratory once for assessment of muscle activity of the fibularis longus during a sudden inversion perturbation and for the assessment of postural sway before and after the application of kinesiology tape for 20 min or a 20-min control period.

Before the data collection, all participants were informed about the study procedures and then were asked to sign the written informed consent. After that, they were

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