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## INFLUENCE OF ANKLE DEVICES IN POSTURAL BALANCE OF YOUNG WOMEN

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### SUMMARY

The proprioceptive sensory information is essential for the control of postural balance. In sprain cases it becomes compromised, being the kinesiotaping one of the most used strategies for treating and preventing. Therefore, this study aimed to evaluate the influence of rigid tape and elastic tape on static postural balance of young women.

The study included 10 young women with mean age, weight and height of  $22.2 \pm 2.09$  years,  $59.15 \pm 4.43$  kg and  $163.05 \pm 7.48$  cm, respectively. For postural balance assessment, two trials of 30 seconds were performed for each condition, one with opened eyes (OE) and the other with closed eyes (CE). The subjects underwent three different situations for each condition (OE and CE): without tape, with rigid tape and with elastic tape of 15 to 20% tension, totaling 6 assessments. The ANOVA test was used to compare the different situations.

The results showed a statistically significant difference for the variable displacement in the anteroposterior (COPap) in OE condition between the situations without tape and with elastic tape ( $p = 0.042$ ), being that with the rigid tape individuals showed greater postural sway. It is concluded that the application of tape on the ankle in young women has not been able to reduce oscillation in the directions anteroposterior (ap) and mediolateral (ml), and the COP velocity.

### INTRODUCTION

Postural control is an important physical valence in the daily living and sport tasks. The maintenance of posture requires the central nervous system to organize the information sent by the sensory systems (visual, vestibular and somatosensory) and interact with the neuromuscular system for optimal functioning. [1]

According to Duarte & Freitas [1] and Baldaço et al. [2], proprioceptive sensory information is essential for the control of postural balance. These refer to the perception of the mechanoreceptors to discriminate body position and joint movements and stresses on tendons during static or dynamic gait [3], contributing with the other information to maintain balance as well as stabilize the joints [1 2].

One of the most used strategies to help in the treatment and prevention for ankle sprain is kinesiotaping as it has the function of protection against trauma, avoiding the overload by stabilizing the articular structure, capsule and ligaments, allowing a functional loading and immobilizing only the injured tissues or predisposed to injury [4,5], besides reducing the pain and restore muscle function [6].

However, there is no consensus for the application of the technique and type of tape that provides greater stabilization to the injured segment. Thus, this study aimed to evaluate the influence of rigid tape and elastic tape on static postural balance of young women.

### METHODS

The group included 10 young women with mean age, weight and height of  $22.2 \pm 2.09$  years,  $59.15 \pm 4.43$  kg and  $163.05 \pm 7.48$  cm, respectively, and all of them agreed with the free informed consent.

To assess postural balance an AMTI model OR6-6 force plate was used. The raw forces and moments data from the force plate were filtered through a low-pass 4<sup>th</sup> order Butterworth filter with cutoff frequency of 10 Hz then, the center of pressure (COP) coordinates were calculated. The variables analyzed were the COP displacement in the anteroposterior (COPap) and mediolateral (COPml) directions and average velocity of the COP (COPvm).

To assess postural balance, subjects were instructed to remain as still as possible on the force plate, in the standing position with the feet aligned to the hip joint and staring at a point located approximately 2 meters away. A graph paper was used a to mark the placement of the feet. There were two trials of 30 seconds for each condition, one with opened eyes (OE) and the other with closed eyes (CE) with a acquisition frequency of 100 Hz.

The elastic tape was of the Kinesio® Tex Gold Business brand and was applied as the technique used by Halseth et al [5] based on the model of Kenzo Kase's Kinesio™ manual taping. Rigid tape of inelastic adhesive tape was applied according to the model used by Silva and Gonçalves [7] based on the method Gibney associated with heel lock, proposed by Wilkerson. The subjects underwent three different situations for each condition (OE and CE): without

tape, with rigid tape and elastic tape with 15 to 20% tension, totaling 6 ratings.

The data normality was verified using the Shapiro-Wilk's test. For the variance analysis between different situations in each condition ANOVA test was used with Bonfferoni post hoc test. The significance level was set at 5% ( $p < 0.05$ ). For analyzes SPSS package version 13.0 was used.

## RESULTS AND DISCUSSION

The results showed a statistically significant difference for the variable COPap in OE condition between the situations without tape and with rigid tape ( $p = 0.042$ ), being that with the rigid tape individuals showed greater postural sway.

Robbins et al. [8] evaluated the sensory control of the foot position in individuals with tape, comparing with individuals without tape, before and after 30 minutes of running. The tape technique used in the study was "Gibney basket weave" with a double locking calcaneus. The results show that the tape had a positive influence on proprioceptive ability, with an improvement of 19% in sensitivity of foot position before exercise, compared to the control group ( $p < 0.001$ ). The authors concluded that this technique improves sensitivity tape on proprioceptive awareness of foot position before and after exercise. This modification can generate a better response in body sway on these individuals, which was not found in the present study. This may be due to the fact, in this study, the application of tape was performed at the time of collection, not having much time proprioceptive stimulus.

In another study, Hopper et al. [9] investigated the influence of Mulligan tape balance in subjects with chronic ankle instability, using measures of measuring static and dynamic balance on a force platform. The authors concluded that the technique of Mulligan tape yielded no influence on neuromuscular control during tests, which are aiming to fatigued individuals. These findings may indicate that the application of the tape in a short time is not able to generate sufficient stimulus to interfere with the balance of the individuals, confirming the findings of this study in which the use of the tape has not helped to reduce significantly postural oscillation.

## CONCLUSIONS

The application of tape on the ankle in young women was not able to reduce oscillation in the directions ap and ml, and the velocity of COP. Therefore, more studies are needed to verify the effectiveness of other tape techniques and performing more than one application over time to investigate the influence influence of taping in stabilization of ankles.

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