DOES ELASTIC TAPING ON THE TRICEPS SURAE FACILITATE THE ABILITY OF VERTICAL JUMP?

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INTRODUCTION

Elastic taping applied on the triceps surae has been commonly used by the athletes to improve the performance of lower extremity. It has been described by the athletes that elastic taping to the triceps surae would make them “feel” stronger in jumping. However, less objective and solid evidences have been documented. For athletes, vertical jump is an indicator of performance capacity of lower extremity. The purpose of this study was to investigate the effect of elastic taping on the triceps surae during maximal vertical jump.

METHODS

Thirty-one healthy adults (19 men and 12 women) aged from 20 to 31 were recruited. All participants received vertical jump tests prior to and during elastic taping. Two elastic tapes, tape A and tape B from 2 different manufactories, were applied to the participants, respectively. After a brief warm-up, participants performed the vertical jump test in the following sequence: (a) five trials of maximal vertical jump as baseline trials, (b) the elastic tapes were applied over bilateral triceps surae muscles by a physical therapist, and (c) another five trials were tested 30 minutes after application. Vertical component of the ground reaction force (GRF) was collected using the Kistler force plates at a sampling rate of 1000 Hz, while electromyographic (EMG) activity was recorded from the plates at a sampling rate of 1000 Hz, while maximal vertical jump as baseline trials, and from 20 to 31 were recruited. All participants received elastic taping on the triceps surae during maximal vertical jump tests prior to and during elastic taping. Two elastic manufactories, were applied to the participants, respectively. After a brief warm-up, participants performed the vertical jump test in the following sequence: (a) five trials of maximal vertical jump as baseline trials, (b) the elastic tapes were applied over bilateral triceps surae muscles by a physical therapist, and (c) another five trials were tested 30 minutes after application. Vertical component of the ground reaction force (GRF) was collected using the Kistler force plates at a sampling rate of 1000 Hz, while electromyographic (EMG) activity was recorded from the medial gastrocnemius (MG), tibialis anterior (TA), and soleus (Sol) muscles using Ag-AgCl electrodes (MA-300 EMG system) at a sampling rate of 1000 Hz during the whole jump task. The height of maximum jump was measured using the video-based motion analysis system (Motion Analysis Corporation, Santna Rosa CA, USA) with three-dimensional trajectories at a sampling rate of 100 Hz. Only the best three trials were used for analysis. Averaged maximum vertical jump height, maximum GRF, and integrated EMG activity were calculated using paired t-tests for pre- and post taping (α= 0.05) [2].

RESULTS AND DISCUSSION

The results showed that GRF, significantly increased (p=0.026) during jumping task when tape A was applied even the height of jump remained mostly the same. However, the height of jump show significant decrease and there were no statistically significance on GRF in group B (Table 1).

Although the EMG activity of MG tend to increase in group A, we cannot see significant differences in EMG activity of MG, TA and soleus muscles in both groups. The contribution of hip extensors is achieved greater than the ankle and knee muscle effort at the maximal jump height [3]. The unchanged height in group A may be due to this mechanism.

CONCLUSIONS

Significant increase in GRF, after application of elastic tape reflects that the elastic taping might facilitate the muscle contraction capacity of the triceps surae during vertical jump. Further research should be directed to explore the underlying the mechanisms.

REFERENCES