

Meeting Abstract

Effects of two types of functional bandage on rotational mechanics of the knee during the run

Efecto de dos tipos de vendaje funcional sobre la mecánica de la rotación de la rodilla durante la carrera

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Introduction

The knee is the joint with highest incidence of injury in runners. One of the causes has been related to the rotational stress during the run (1). In the clinical practice is common the use of functional bandage (FB), such as: Kinesiotape (KT) and taping (TP), tools that has been transformed in method of prevention and injury rehabilitation (2,3). There is evidence of the proprioceptive effect and the modification of kinetic variables when a bandage is applied on the ankle, affecting indirectly on the knee (4). However, there are few studies about the application of bandage a on the knee in runners and its biomechanics implications. The objective of this investigation was to compare the kinematic and rotation kinetic of the knee during the run in three conditions: without bandage, with kinesiotape (KT) and with Taping (TP) on the knee.

Methodology

The study assessed ten young participants, men and woman, between 18 and 24 years (age: 20.1±2.2 years; mass: 61.9±12.5 kg; height: 1.6±0.17 m). Were excluded all people with musculoskeletal and neurological problems, asymmetric lower limb and traumatic lesions. All volunteers gave their written consent. The run was evaluated with a 3D motion analysis system, with eight infrared cameras (T-Series; Vicon Motion Systems, Oxford, UK), with a frequency of 200Hz. The force applied on the floor was measure with one force plate (Bertec, FP4060-05-PT-1000, USA), at a frequency of 1000Hz. The internal rotation moment was calculate with the inverse dynamic method. A biomechanical model was created with different anthropometric measurements using the software Nexus (Vicon Motion System, UK). One set of 16 reflective markers were used to represent the body segments. The kinematic and kinetic register were identified with the initial contact of dominant foot with the force plate. The moment were normalized to subject body mass and the kinetic energy. Each participant ran with KT, TP on the anterior knee zone and without this bandage. Analysis of ANOVA and post hoc of Dunnett was

performed to determine the effects of three conditions. Alpha level was set at 0.05, the statistical analysis was conducted with the software GraphPad Prism 6.01.

Results

It was observed a statistically significant effect in the internal rotation moment with TP, which was higher than the condition without bandage (TP=0.00086 Nm/kg/J; WB= 0.00067 Nm/kg/J; p=0.041). The kinematic did not describe significant differences between the bandages.

Discussion

It was detected that the presence of the TP on the anterior knee zone increases the internal rotation moment, which could facilitate the neutralization of external rotation moment generated during the run. This could reduce the joint stress of knee developed during the run.

In the sample evaluated, the use of TP generate a change in the kinetic of knee, favoring development of internal rotation moment. However the use of KT did not show effects on the biomechanics of the knee in runners.

References

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