



ORIGINAL ARTICLE

Effects of a 6-week neuromuscular ankle training program on the star excursion balance test for basketball players[☆]

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KEYWORDS

Postural balance;
Proprioception;
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Basketball;
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Abstract

Background: The largest percentage of injuries in basketball affect the lower limbs, specially the ankle joint, and this is the major cause of missed days of training during a season. Moreover, ankle injuries can increase the risk factor of recurrent injuries.

Objectives: To determine whether a training program, based on specific ankle exercises for basketball, causes a change in the dynamic stability of a healthy group of basketball players, using the Star Excursion Balance Test (SEBT). Also, to determine the ideal number of repetitions to obtain a reliable measure of the test.

Materials and methods: Experimental study. Seventeen uninjured basketball players participated (8 experimental (EG), 9 control (CG)) (EG = 15.12 yrs ± 0.83 yrs / CG = 14.67 yrs ± 1.0 yrs). The EG performed the training program during the warm-up, and the CG completed the regular warm-up. The SEBT was performed before and after the 6-week training program. In statistical analysis MANOVA 2* 2 was used per group and time.

Results: Only the measurements for the Posterior-Lateral direction were significant, namely in 2 groups (CG: Mdif = 15.5, P = .002 (95% CI: 6.83–24.17 cm) EG: Mdif = 12.063, P = .014 (95% CI: 2.87–21.26 cm)). There were no differences in the SEBT between groups after the training protocol.

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PALABRAS CLAVE

Equilibrio postural;
Propiocepción;
Entrenamiento;
Básquet;
Lesiones de tobillo

Conclusions: One attempt seems to be sufficient for the completion of the test. The completion of a specific training program for healthy basketball players does not demonstrate improvements in the balance.

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Efectividad de un programa de entrenamiento neuromuscular de 6 semanas de duración aplicado en el tobillo en la realización del star excursion balance test en jugadores de básquet

Resumen

Introducción: La mayoría de las lesiones que se registran en la práctica del baloncesto se localizan en la extremidad inferior, especialmente en el tobillo, y son la principal causa de ausencia en las sesiones de entrenamiento. Estas lesiones pueden repercutir en un aumento del riesgo de recidiva de la lesión.

Objetivos: Determinar si un programa de entrenamiento propioceptivo, confeccionado en base a ejercicios propios del baloncesto, podría provocar un cambio en la estabilidad dinámica de un grupo de jugadores de baloncesto, usando el Star Excursion Balance Test (SEBT) para su valoración. Determinar el número de repeticiones necesarias para la correcta interpretación del SEBT.

Material y métodos: Estudio experimental. Se seleccionaron 17 jugadores de baloncesto (8 grupo experimental [GE] y 9 grupo control [GC]); GE = 15,12 ± 0,83 años; GC = 14,67 ± 1,0 años. El GE realizó un programa de entrenamiento específico durante el calentamiento, mientras que el GC completó su rutina habitual. El SEBT se realizó antes y después de 6 semanas de desarrollo del programa. Para el análisis estadístico se utilizó un MANOVA 2 * 2, por grupo y tiempo.

Resultados: Solo las mediciones para la dirección postero lateral fueron significativas en los 2 grupos (GC: MDIF = 15,5; p = 0,002; IC 95%: 6,83-24,17 cm; GE: MDIF = 12,063; p = 0,014; IC 95%: 2,87-21,26 cm). No existieron diferencias significativas entre los grupos para las demás direcciones.

Conclusiones: Una repetición del test fue suficiente. La realización de un programa específico de propiocepción para jugadores sanos de baloncesto no obtuvo mejoras en el equilibrio.

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Introduction

Most of the injuries which take place in basketball occur in the lower limb.^{1,2} The largest percentage of these affect the foot, the collateral ligament sprains being the most common injury.^{3,4} This injury usually affects the anterior talofibular ligament (ATFL), and is the major cause of missed days of training during the season (from 1 to 3.5). In a study of 1094 players, Starkey³ described ankle injuries as the leading cause of missed days of training (9.4%); Deitch et al.⁵ found a similar relationship (18% of all injuries) when they followed professional players (NBA, WNBA) during six seasons and Borowski et al.,¹ recorded 1518 foot injuries (39.7%) in University basketball leagues.

In addition, ankle injuries can have several consequences. From a functional point of view, the risk factor of recurrent injuries should be noted, as the risk of injury for individuals with previously injured ATFL increases by five.⁶ From a morphological point of view, between 55% and 72% of cases lead to osteochondritis during the year after

the injury,⁷ and between 10% and 50% experience residual pain in the area, due to soft tissue entrapment of the ankle joint.⁸

Tearing the ATFL of the ankle joint is caused by a combined mechanism of plantar flexion and ankle supination, usually following a jump-landing cycle.^{1,9} The sport with the highest risk of this happening is basketball¹⁰ and among risk factors that can influence this injury it seems to include gender, height, weight, age and days of training.^{8,9,11}

Given this problem, especially in previously injured individuals, one of the best solutions seems to be prevention. Several authors advise carrying out a preventive program to reduce the risk of ankle injury.¹²⁻¹⁴ Freeman et al.¹⁵ described improvements in stability in those patients who follow an exercise program rather than simply immobilizing the area. Eils and Rosenbaum¹⁶ and McGuine and Keene¹¹ have found a decrease in injuries of between 35% and 38% in subjects who follow a program of proprioception and McKeon and Hertel¹⁷ recorded improvements in rebalancing capabilities.

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