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Original Research

Explosive Strength Imbalances in Professional Basketball Players

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Abstract

Context: Despite the high rate of lower limb injuries in basketball players, studies of the dominant-limb effect in elite athletes often neglect injury history.

Objective: To determine lower limb explosive-strength asymmetries in professional basketball players compared with junior basketball players and control participants.

Design: Cohort study.

Setting: Academic medical institution.

Patients or Other Participants: 15 professional basketball players, 10 junior basketball players, and 20 healthy men.

Main Outcome Measure(s): We performed an isokinetic examination to evaluate the knee extensor (Ext) and flexor (Fl) concentric peak torque at $60°\cdot s^{-1}$ and $240°\cdot s^{-1}$ and (Fl only) eccentric peak torque at $30°\cdot s^{-1}$ and $120°\cdot s^{-1}$. Functional evaluation included countermovement jump, countermovement jump with arms, 10-m sprint, single-leg drop jump, and single-leg, 10-second continuous jumping. Variables were compared among groups using analysis of variance or a generalized linear mixed model for bilateral variables.

Results: The 2 groups of basketball players demonstrated better isokinetic and functional performances than the control group did. No differences in functional or relative isokinetic variables were noted between professional and junior basketball players. Professional players with a history of knee injury failed to reach normal knee extensor strength at $60°\cdot s^{-1}$. Knee Ext ($60°\cdot s^{-1}$) and Fl (eccentric $120°\cdot s^{-1}$) torque values as well as 10-second continuous jumping scores were higher in those professional players without a history of knee injury than those with such a history. Compared with the group without a history of knee injury, the group with a history of knee injury maintained leg asymmetry ratios greater than 10% for almost all isokinetic variables and more than 15% for unilateral functional variables.

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Conclusions: The relative isokinetic and functional performances of professional basketball players were similar to those of junior players, with no dominant-side effect. A history of knee injury in the professional athlete, however, was reflected in bilateral isokinetic and functional asymmetries and should be considered in future studies of explosive strength.

Keywords: isokinetic activity, muscular balance, knee injuries

Marc Schiltz, MD; Cédric Lehance, PT; Didier Maquet, PhD, PT; Thierry Bury, MD, PhD; Jean-Michel Crielaard, MD, PhD; and Jean-Louis Croisier, PhD, PT, contributed to conception and design; acquisition and analysis and interpretation of the data; and drafting, critical revision, and final approval of the article.

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