Muscular imbalances, determined by isokinetic and functional tests, in professional basketball players

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Context: Studies of dominant limb effect in elite athletes often neglect injury history while lower limb injury rate is high in basketball.

Objective: Determine lower limb explosive strength asymmetries in professional basketball players in comparison to junior basketball players and control subjects.

Design: Cohort study.

Setting: Academic medical institution.

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

Data collection and Analysis: Isokinetic examination evaluated knee extensors (Ext) and flexors (Fl) peak torque (PT) at 60°·sec⁻¹ and 240°·sec⁻¹ concentric, 30°·sec⁻¹ and 120°·sec⁻¹ eccentric (Fl only). Functional evaluation included: counter movement jump (CMJ), CMJ with arms, 10m sprint, single leg drop jump and single leg 10s continuous jumping. Variables were compared between groups using analysis of variance (GLM) or a generalized linear mixed model (GLMM) for bilateral variables.

Results: The two basketball players groups recorded in general significantly better isokinetic and functional performances than the control group. No functional or relative isokinetic parameters (Nm·kg⁻¹) could demonstrate a significant difference between professional and junior basketball players. Professional players with a history of knee injury failed to reach normal knee extensor strength at 60°·sec⁻¹. Knee Ext (60°·sec⁻¹), Fl (Ecc 120°·sec⁻¹) as well as 10s continuous jumping scores were significantly higher in professional players without than with knee injury history. The injury history group maintained leg asymmetry ratios > 10% for almost all isokinetic and > 15% for unilateral functional parameters.

Conclusions: Relative isokinetic and functional performances of professional basketball players are similar to junior players, with no dominant side effect. A history of knee injury in the professional athlete however translates into significant bilateral isokinetic and functional asymmetries and must be considered in future explosive strength studies.

Key words: Isokinetic - Muscular Balance - Injury History – Knee.