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ORIGINAL RESEARCH

THE EFFICACY OF ANGLE-MATCHED ISOKINETIC KNEE FLEXOR AND EXTENSOR STRENGTH PARAMETERS IN PREDICTING AGILITY TEST PERFORMANCE

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ABSTRACT

Background: Agility is a fundamental performance element in many sports, but poses a high risk of injury. Hierarchical modelling has shown that eccentric hamstring strength is the primary determinant of agility performance.

Purpose: The purpose of this study was to investigate the relationship between knee flexor and extensor strength parameters and a battery of agility tests.

Study Design: Controlled laboratory study.

Methods: Nineteen recreational intermittent games players completed an agility battery and isokinetic testing of the eccentric knee flexors (eccH) and concentric knee extensors (conQ) at 60, 180 and 300°·s^{-1}. Peak torque and the angle at which peak torque occurred were calculated for eccH and conQ at each speed. Dynamic control ratios (eccH:conQ) and fast:slow ratios (300:60) were calculated using peak torque values, and again using angle-matched data, for eccH and conQ. The agility test battery differentiated linear vs directional changes and prescriptive vs reactive tasks.

Results: Linear regression showed that eccH parameters were generally a better predictor of agility performance than conQ parameters. Stepwise regression showed that only angle-matched strength ratios contributed to the prediction of each agility test. Trdaitionally calculated strength ratios using peak torque values failed to predict performance. Angle-matched strength parameters were able to account for 80% of the variation in T-test performance, 70% of deceleration distance, 55% of 10m sprint performance, and 44% of reactive change of direction speed.

Conclusions: Traditionally calculated strength ratios failed to predict agility performance, whereas angle-matched strength ratios had better predictive ability and featured in a predictive stepwise model for each agility task.

Level of Evidence: 2c

Key words: Agility, hamstring, injury, isokinetic, strength

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