

EFFECTS OF FATIGUE ON INTRINSIC RISK FACTORS IN ENGLISH SOCCER PLAYERS

Rahnama N, Reilly T, Lees A

Research Institute for Sport and Exercise Sciences, John Moores University, Liverpool, UK

Introduction

It has been reported that how hamstrings/quadriceps strength ratios have been proposed as a cause of hamstrings strains (Orchard et al. 1997). Ekstrand and Gillquist (1983) suggested that an imbalance in muscle strength between limbs (intrinsic risk factor) may predispose a players towards musculoskeletal injury. In later study, Fowler and Reilly (1993) reported a 20 % difference in muscle strength in professional soccer players prone to injury. Since, hamstrings have a high percentage of fast twitch fibres (Garrett et al. 1984), it is expected that when fatigued, its ratio with quadriceps changes. Therefore, the aim of this study was to determine whether prolonged exercise would significantly reduce the hamstrings/quadriceps strength ratios.

Methods

Ten professional soccer players initially performed one familiarisation session, and then in the next session they completed a 90 min fatiguing exercise which simulated the work-rate of soccer. Concentric and eccentric hamstrings and quadriceps torque values were recorded before commencing the simulated game and after finishing the simulated game. All torque values (Lido) of the dominant and non-dominant legs were measured at angular velocities of 1.05, 2.09 and 5.23 rad.s⁻¹. Paired sample t-tests were used to determine whether significant decrease occurred in any torques ratios measured with the fatiguing exercise.

Results

The results indicated significant changes in muscle balance between the pre-exercise and post-exercise for the dominant leg at 2.09 rad.s⁻¹ (= 0.61 0.08 vs 0.54 0.10; P < 0.05), at 5.23 rad.s⁻¹ (= 0.81 0.08 vs 0.75 0.11; P < 0.05) and 2.09 rad.s⁻¹ (ecc) (= 0.78 0.08 vs 0.68 0.10; P < 0.05) with ratios being greater before game than after game. For the non-dominant leg, significant changes were observed only at 1.05 rad.s⁻¹ (= 0.57 0.10 vs 0.55 0.10; P < 0.05). Although the ratio was higher for the pre-exercise measures than post- exercise measures at the other angular velocities, the differences were not statistically significant. No significant differences were observed in the left/right ratio (P > 0.05) at all angular velocities.

Conclusions

It was concluded that fatiguing exercise similar to that experienced in a game of soccer can significantly decrease the hamstrings/quadriceps ratio but does not effect on the left/right ratio. This reduction in hamstrings/quadriceps ratio towards the end of a soccer game may increase the susceptibility of the hamstrings to injury.

References

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