

## ISOKINETIC STRENGTH, IPSILATERAL AND BILATERAL RATIO OF PEAK MUSCLE TORQUE IN KNEE FLEXORS AND EXTENSORS IN ELITE YOUNG SOCCER PLAYERS

### Abstract

The aim of the study was to determine the profile of isokinetic strength of elite young soccer players ( $n = 12$ , mean age  $17.5 \pm 1.5$  years). Assessment was performed on the isokinetic dynamometer. We evaluated: maximum peak muscle torque of knee extensors ( $PT_E$ ) and flexors ( $PT_F$ ) in both legs, ipsilateral ratio of muscle torque for both preferred and non-preferred extremities ( $H:Q_p$  and  $H:Q_N$ , respectively), bilateral ratio between the exerted strength of knee extensors ( $Q_p:Q_N$ ) and flexors ( $H_p:H_N$ ). Strength parameters were obtained in the concentric contraction at angular velocities of 60, 120, 180, 240 and  $300^\circ \cdot s^{-1}$ .  $PT_E$  and  $PT_F$  were significantly reduced with increasing movement velocity in both extremities ( $p < 0.05$ ). At all velocities,  $PT_E$  was higher in the preferred extremity. A significant difference was at  $60^\circ \cdot s^{-1}$  ( $p < 0.05$ ). We did not find any significant difference in the level of strength between the preferred and non-preferred extremities in  $PT_F$  ( $p > 0.05$ ). Increasing angular velocity had a significant effect on the size of ipsilateral  $H:Q$  ratio in both extremities ( $p < 0.05$ ). The bilateral ratio of exerted strength in knee extensors, or flexors respectively, was not significantly different in the movement velocity ( $p > 0.05$ ). At the highest velocity, a significant difference was found between the bilateral  $Q_p:Q_N$  and  $H_p:H_N$  ratios ( $p < 0.05$ ). Precise determination and quantification of muscle strength imbalances is essential for determination of the fundamental level of organized and intentionally controlled training process and for early compensation of the found imbalances as prevention against potential injury of athletes.

**Key words:** physical examination, resistance training, muscle strength, health, athletic injuries

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