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BACZKOWSKI K , et al.

A new look into kicking a football: an investigation of muscle activity using MRI.

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The kicking action predominantly used in Australian Rules football is considered to be responsible for many lower limb injuries. The aim of this study was to describe a non-invasive method of identifying the thigh muscles involved in kicking an Australian Rules football, using MRI. Both upper thighs of 10 recreational footballers were examined using a 1.5-T General Electric MRI scanner before and immediately after carrying out a set kicking exercise protocol. The signal intensity (SI) changes in 14 individual muscles were investigated using a standardized region of interest to determine the levels of muscle activity. Significant SI changes were observed in several muscles of the kicking and stance legs among all participants. In the kicking leg, the greatest SI changes were observed in the adductor longus and tensor fascia latae muscles (49.38% (+/-8.95) and 45.47% (+/-7.91), respectively; $P < 0.05$), whereas in the stance leg, the muscles displaying the highest changes were the semitendinosus and tensor fascia latae muscles (46.48% (+/-9.97) and 33.68% (+/-8.36), respectively; $P < 0.05$). This study has shown that MRI can be useful for observing the activity of individual muscles in the upper thigh during the kicking motion. This non-invasive approach provides a detailed analysis of anatomy and emphasizes the muscles at high risk of injury.

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MeSH terms: Adult, Football, Humans, Lower Extremity, Magnetic Resonance Imaging, Male, Motor Activity, Muscle, Skeletal

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