研究業績　英文表記

和文	
表題	4 週間のスタティックストレッチング介入における腓腹筋筋腱複合体の経時的な変化の検討
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英文	
Title	Changes in passive properties of the gastrocnemius muscle–tendon unit during a 4-week routine static stretching program
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Abstract	Context: Static stretching (SS) is commonly performed in a warm-up routine to increase joint range of motion (ROM) and to decrease muscle stiffness. However, the time course of changes in ankle-dorsiflexion (DF) ROM and muscle stiffness during a routine SS program is unclear. Objective: To investigate changes in ankle-DF ROM, passive torque at DF ROM, and muscle stiffness during a routine SS program performed 3 times weekly for 4 wk. Design: A quasi-randomized controlled-trial design. Participants: The subjects comprised 24 male volunteers (age 23.8 ± 2.3 y, height 172.0 ± 4.3 cm, body mass 63.1 ± 4.5 kg) randomly assigned to either a group performing a 4-wk stretching program (SS group) or a control group. Main outcome measures: DF ROM, passive torque, and muscle stiffness were measured during passive ankle dorsiflexion in both groups using a dynamometer and ultrasonography once weekly during the 4-wk intervention period. Results: In the SS group, DF ROM and passive torque at DF ROM significantly increased after 2, 3, and 4 wk compared with the initial measurements. Muscle stiffness also decreased significantly after 3 and 4 wk in the SS group. However, there were no significant changes in the control group. Conclusions: Based on these results, the SS program effectively increased DF ROM and decreased muscle stiffness. Furthermore, an SS program of more than 2 wk duration effectively increased DF ROM and changed the stretch tolerance, and an SS program more than 3 wk in duration effectively decreased muscle stiffness.
keyword	muscle stiffness; stretch tolerance; time course; ultrasound.

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