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学位の種類	博士（理学療法学）
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課程・論文の別	学位規則第4条第1項該当
学位論文題名	Sequential Changes in Activity of Hip Abductor Muscles after Side-lying Hip Abduction Exercise with Different Directions using Muscle Functional Magnetic Resonance Imaging (筋機能的磁気共鳴画像法を用いた異なる方向への股関節外転運動後の股関節外転筋群の筋活動の経時的変化)
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### 【論文の内容の要旨】

Background: Hip abductor muscle weakness is associated with various lower extremity injuries. Side-lying hip abduction exercises to strengthen the hip abductor muscles is frequently used in rehabilitation and injury prevention programs without scientific evidence regarding their ability to activate the targeted muscles. In addition, previous studies have not quantified the activity of hip abductor muscles during side-lying hip abduction exercises in different directions.

Objectives: To measure the T2 values of hip abductor muscles during side-lying hip abduction exercises in different directions using magnetic resonance imaging and to clarify variations in the activity of each segment of the gluteus medius, upper fiber of the gluteus maximus, gluteus minimus, and tensor fasciae latae.

Methods: The T2 values measured using magnetic resonance imaging were used to quantify the activity level of the hip abductor muscles in 10 healthy young males during side-lying hip abduction with different directions (neutral hip, internal rotation and flexion, external rotation, and extension). The two-way repeated measures analysis of

variance analysis was used to determine differences between the groups over time.

Results: The T2 values of all muscles, excluding the upper fiber of the gluteus maximus, significantly increased after exercise with all motor tasks over time. The anterior segment of the gluteus medius was significantly increased with side-lying abduction with internal rotation and flexion compared to that with side-lying abduction with external rotation and extension. In contrast, the posterior segments of the gluteus medius and upper fiber of the gluteus maximus were significantly increased with side-lying abduction with external rotation and extension compared to that during other tasks.

Conclusions: The results suggest that side-lying hip abduction exercise with different directions influences the difference in muscle activity between hip abductor muscles and reflects differences in the function of the hip abductor muscles.