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Autor(en) des Beitrags:
Kumar, Deepak, D; Subburaj, Karuppasamy, K; Lin, Wilson, W; Karampinos, Dimitrios C, DC; McCulloch, Charles E, CE; Li, Xiaojuan, X; Link, Thomas M, TM; Souza, Richard B, RB; Majumdar, Sharmila, S

Titel des Beitrags:
Quadriceps and hamstrings morphology is related to walking mechanics and knee cartilage MRI relaxation times in young adults.

Abstract:
Controlled laboratory study using a cross-sectional design. To analyze the relationship of quadriceps-hamstrings and medial-lateral quadriceps anatomical cross-sectional area (ACSA) ratios with knee loads during walking and articular and meniscal cartilage composition in young, healthy subjects. Muscle forces affect knee loading during walking, but it is not known if muscle morphology is associated with walking mechanics and cartilage composition in young subjects. Forty-two knees from 27 young, healthy, active volunteers (age, 20-35 years; body mass index, <28 kg/m(2)) underwent 3-T magnetic resonance imaging (MRI) and 3-D motion capture. Standard MRI sequences were used for articular and meniscal cartilage T1rho and T2 relaxation times and for quadriceps and hamstrings muscle ACSA. Frontal plane kinetics during the stance phase of walking was calculated. Generalized estimating equation models were used to identify muscle variables that predicted MRI and gait parameters. Quadriceps-hamstrings and medial-lateral quadriceps ACSA ratios were positively related to frontal plane loading (r = .21-.54, P <= .006), global articular cartilage relaxation times (r = .22-.28, P <= .041), and the medial-lateral ratio of meniscus T1rho.
relaxation time (? = .26-.36, P<=.049). The medial-lateral quadriceps ACSA ratio was positively related to global meniscus T1rho relaxation times (? = .30, P = .046). Higher quadriceps-hamstrings and medial-lateral quadriceps ACSA ratios were associated with higher frontal plane loading during walking and with articular and meniscal cartilage T1rho and T2 relaxation times. These findings highlight the relationships between different knee tissues and knee mechanics in young, healthy individuals.

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