Patellar cartilage: T2 values and morphologic abnormalities at 3.0-T MR imaging in relation to physical activity in asymptomatic subjects from the osteoarthritis initiative.

Abstract:

To study the interrelationship between patella cartilage T2 relaxation time, other knee abnormalities, and physical activity levels in asymptomatic subjects from the Osteoarthritis Initiative (OAI) incidence cohort. The study had institutional review board approval and was HIPAA compliant. One hundred twenty subjects from the OAI without knee pain (age, 45-55 years) and with risk factors for knee osteoarthritis (OA) were studied by using knee radiographs, 3.0-T knee magnetic resonance (MR) images (including intermediate-weighted fast spin-echo and T2 mapping sequences), and the Physical Activity Scale for the Elderly. MR images of the right knee were assessed by two musculoskeletal radiologists for the presence and grade of abnormalities. Segmentation of the patella cartilage was performed, and T2 maps were generated. Statistical significance was determined by using analysis of variance, chi(2) analysis, correlation coefficient tests, the Cohen kappa, and a multiple linear regression model. Cartilage lesions were found in 95 (79.0%) of 120 knees, and meniscal lesions were found in 54 (45%) of 120 knees. A significant correlation between patella cartilage T2 values and the severity and grade of cartilage (P = .0025) and meniscus (P = .0067) lesions was demonstrated. Subjects with high activity levels had significantly higher prevalence and
grade of abnormalities and higher T2 values (48.7 msec +/-4.35 vs 45.8 msec +/-3.93; P< .001) than did subjects with low activity levels. Middle-aged asymptomatic individuals with risk factors for knee OA had a high prevalence of cartilage and meniscus knee lesions. Physically active individuals had more knee abnormalities and higher patellar T2 values. Additional studies will be needed to determine causality.