Physical activity is associated with magnetic resonance imaging-based knee cartilage T2 measurements in asymptomatic subjects with and those without osteoarthritis risk factors.

Abstract:

To evaluate the association of exercise and knee-bending activities with magnetic resonance imaging (MRI)-based knee cartilage T2 relaxation times and morphologic abnormalities in asymptomatic subjects from the Osteoarthritis Initiative, with or without osteoarthritis (OA) risk factors. We studied 128 subjects with knee OA risk factors and 33 normal control subjects ages 45-55 years, with a body mass index of 18-27 kg/m(2) and no knee pain. Subjects were categorized according to exercise level, using the leisure activity component of the Physical Activity Scale for the Elderly, and by self-reported frequent knee-bending activities. Two radiologists graded the cartilage of the right knee on MR images, using the Whole-Organ MRI Score (WORMS). Cartilage was segmented, and compartment-specific T2 values were calculated. Differences between the exercise groups and knee-bending groups were determined using multiple linear and logistic regression models. Among subjects with risk factors for knee OA, light exercisers had lower T2 values compared with sedentary and moderate/strenuous exercisers. When the sexes were analyzed separately, female moderate/strenuous exercisers had higher T2 values compared with sedentary individuals and light exercisers. Subjects without risk factors displayed no significant
differences in T2 values according to exercise level. However, frequent knee-bending activities were associated with higher T2 values in both subjects with OA risk factors and those without OA risk factors and with more severe cartilage lesions in the group with risk factors. In subjects at risk of knee OA, light exercise was associated with low T2 values, whereas moderate/strenuous exercise in women was associated with high T2 values. Higher T2 values and WORMS grades were also observed in frequent knee-benders, suggesting greater cartilage degeneration in these individuals.