Correlation of magnetic resonance imaging-based knee cartilage T2 measurements and focal knee lesions with body mass index: thirty-six-month followup data from a longitudinal, observational multicenter study.

Abstract:

To compare magnetic resonance imaging (MRI)-based knee cartilage T2 measurements and focal knee lesions and 36-month changes in these parameters among knees of normal controls and knees of normal weight, overweight, and obese subjects with risk factors for knee osteoarthritis (OA). A total of 267 subjects ages 45-55 years from the Osteoarthritis Initiative database were analyzed in this study. Two hundred thirty-one subjects had risk factors for knee OA, but no radiographic OA (Kellgren/Lawrence score<=1) at baseline. Thirty-six subjects were normal controls. Subjects with OA risk factors were stratified in 3 groups: normal weight (n = 78), overweight (n = 84), and obese (n = 69). All subjects underwent 3T MRI of the right knee at baseline and after 36 months. Focal knee lesions were assessed and cartilage T2 measurements (mean T2 and T2 texture analysis) were performed. The baseline prevalence and severity of meniscal and cartilage lesions were highest in obese subjects and lowest in normal controls (P<0.05). Obese subjects had the highest mean T2 values and the most heterogeneous cartilage (as assessed by T2 texture analysis), while normal...
controls had the lowest mean T2 values and the most homogeneous cartilage at baseline (P< 0.05). Increased body mass index (BMI) was significantly (P< 0.05) associated with greater progression of cartilage lesions and constantly elevated cartilage T2 entropy over 36 months. In preclinical OA, increased BMI is associated with more severe cartilage degeneration as assessed by both morphologic and quantitative MRI measurements.