Cartilage lesion score: comparison of a quantitative assessment score with established semiquantitative MR scoring systems.

To describe a scoring system for quantification of cartilage lesions (Cartilage Lesion Score [CaLS]), to determine its reproducibility, to examine the association of CaLS-detected longitudinal change with known risk factors for osteoarthritis (OA) progression by comparing a group of subjects with OA risk factors with a group of subjects without OA risk factors, and to compare the CaLS system with the established semiquantitative Whole-Organ Magnetic Resonance Imaging Score (WORMS) and Boston-Leeds Osteoarthritis Knee Score (BLOKS) systems in terms of detection of cartilage defect progression. All subjects provided written informed consent, and the local institutional review board approved this HIPAA-compliant study. Fifty-two subjects with and 25 subjects without knee OA were randomly selected from the Osteoarthritis Initiative. Inclusion criteria were age of 45-60 years, body mass index of 19-27 kg/m(2), and no knee pain or OA on radiographs at baseline. Baseline and 24-month follow-up right knee 3-T magnetic resonance images were analyzed with WORMS, BLOKS, and CaLS systems. Progression of cartilage lesions with each scoring system was compared by using multilevel mixed-effects models.
linear-regression models. Intraclass coefficient values for inter- and intraobserver reliability of the CaLS system were 0.86 and 0.91, respectively. Interoobserver value range for individual features was 0.81-0.94. The CaLS system enabled significantly higher detection of cartilage lesion progression than did WORMS or BLOKS systems (P< .001); 51.8% (56 of 108), 17.6% (19 of 108), and 13.0% (14 of 108) of the lesions progressed when analyzed with the CaLS, WORMS, and BLOKS systems, respectively. With the CaLS system, subjects with OA risk factors had significantly higher odds of progression than did subjects without risk factors (odds ratio, 2.78; P = .005). The CaLS system is a reproducible scoring system for cartilage lesions that yields an improved detection rate for monitoring progression when compared with detection rates of semiquantitative WORMS and BLOKS systems.