The purpose of this study was to evaluate meniscal degeneration in healthy subjects and subjects with osteoarthritis (OA) using T1 rho and T2 measurements and to examine the interrelationship between cartilage and meniscus abnormalities. Quantitative assessment of cartilage and meniscus was performed using 3T Magnetic Resonance Imaging (MRI) with a T1 rho and T2 mapping technique in 19 controls and 44 OA patients. A sagittal T2-weighted fast spin echo (FSE) fat-saturated image was acquired for cartilage and meniscal Whole-Organ Magnetic Resonance Imaging Score (WORMS) assessment. Western Ontario and McMasters Universities Arthritis Index (WOMAC) scores were obtained to assess clinical symptoms. The posterior horn of the medial meniscus (PHMED) had the highest incidence of degeneration. Stratifying subjects on the basis of PHMED grade revealed that the T1 rho and the T2 measurements of the PHMED and the medial tibial (MT) cartilage were higher in subjects having a meniscal tear (meniscal grade 2-4) compared to subjects with a meniscal grade of 0 or 1 (P<0.05). While not statistically significant, there was a trend for T1 rho and T2 being higher in PHMED grade 1 compared to grade 0 (P=0.094, P=0.073 respectively). WOMAC scores had a stronger correlation with meniscus relaxation.
Magnetic Resonance (MR) \( T(1?) \) and \( T(2) \) measurements provide a non-invasive means of detecting and quantifying the severity of meniscal degeneration. Meniscal damage has been implicated in OA progression and is correlated with cartilage degeneration. Early detection of meniscal damage represented by elevations in meniscal relaxation measures may identify subjects at increased risk for OA.