

SSC07-03

Weight Loss Is Associated with Slower Cartilage Degeneration Over 48 Months in Obese and Overweight Subjects: Data from the Osteoarthritis Initiative

Monday 10:50-11:00 AM | SSC07-03 | NA

PURPOSE

To investigate the association of different degrees of weight loss with progression of knee cartilage degeneration in overweight and obese subjects.

METHOD AND MATERIALS

In this study, 290 subjects (age 61.7 ± 9.1 y; 171 females) with a BMI ≥ 25 kg/m² from the Osteoarthritis Initiative (OAI) with risk factors for OA or radiographically mild to moderate OA were included. Subjects with weight loss were categorized into groups with a large ($\geq 10\%$, n=36) or moderate amount of weight loss (5-10%, n=109) over 48 months, and were frequency matched to a group with stable weight (BMI change $\leq 3\%$, n=145). Changes of focal cartilage defects assessed with 3T MRI cartilage WORMS (Whole-Organ Magnetic Resonance Imaging Score) and T2 maps of the right knee for five cartilage compartments (patella, medial and lateral femur, medial and lateral tibia) including laminar and texture analysis, were analyzed using multivariate regression models adjusting for age, sex, baseline BMI and KL.

RESULTS

Overall cartilage WORMS showed significantly less progression in both weight loss groups compared to the stable weight group (5-10% weight loss, $P=0.035$; $\geq 10\%$ weight loss, $P<0.0001$) over 48 months and changes were associated with changes of BMI ($r=0.31$, $P=0.02$). Subjects with $\geq 10\%$ weight loss showed significantly less T2 value increase in the bone layer averaged over all compartments compared with stable weight subjects (mean diff. 1.0 msec [95%CI 1.3, 0.6] $P=0.01$), suggesting slower cartilage deterioration, yet no significant change in T2 was found between 5-10% weight loss and stable weight group. In the medial compartment of the $\geq 10\%$ weight loss group, overall T2 and cartilage WORMS changes were significantly less ($P<0.0001$, for each) and homogeneity was increased ($P=0.004$), compared to the group with stable weight.

CONCLUSION

While changes in cartilage defects were significantly associated with the amount of weight loss in all subjects, only subjects with $\geq 10\%$ weight loss showed significantly reduced cartilage deterioration measured with T2. Our data show evidence that weight loss has a protective effect against cartilage degeneration and that a larger amount of weight loss is more beneficial.

CLINICAL RELEVANCE/APPLICATION

MR-based knee cartilage T2 measurements and semiquantitative grading allow monitoring of the protective effect of weight loss on joint health and are useful to determine which amount of weight loss is most beneficial in overweight and obese patients.

FIGURE (OPTIONAL)

http://abstract.rsna.org/uploads/2015/15011594/15011594_h184.jpg