

Are different weight loss regimens in obese and overweight individuals associated with different degrees of cartilage degeneration over 96 months? Data from the Osteoarthritis Initiative

Tuesday 3:20-3:30 PM | SSJ16-03 | Room: E451A

PURPOSE

To investigate MR-based cartilage biochemical degeneration and morphologic joint abnormalities over 96 months in overweight and obese subjects with stable weight and weight loss and to assess how these changes are affected by different weight loss regimens.

METHOD AND MATERIALS

Subjects with a BMI > 25 kg/m² from the Osteoarthritis Initiative (n=760; age 62.6±9.0y; 465 females) with risk factors for or radiographic mild to moderate osteoarthritis were included. Subjects losing weight (>5% of baseline BMI; N=380) were frequency matched to controls with stable weight (N=380) and categorized into groups regarding the weight loss method (diet and exercise, diet only, exercise only). 3T MRI of the right knee was performed at baseline, 48- and 96-months. T2 relaxation time changes of cartilage composition, including laminar and texture analysis as well as morphological knee abnormalities, assessed with Whole-Organ-Magnetic-Resonance-Imaging-Scores (WORMS) were analyzed using mixed random effects models to calculate associations between amount of weight loss and regimen.

RESULTS

Progression of cartilage WORMS was significantly lower in the weight loss group compared to controls (P<0.001) over 96 months. Subjects with weight loss showed significantly less T2-value increase in the bone layer of all compartments (P<0.03, for each) compared to the controls with stable weight, suggesting less cartilage degeneration over 96 months in the subjects with weight loss compared to their controls. Rates of increase in cartilage T2 averaged over all compartments were lowest in the diet and diet and exercise groups compared to the stable weight group (P=0.042 and P=0.003, respectively). Weight loss through exercise alone showed no significant difference in change of T2 over 96 months compared to subjects with stable weight (P=0.56).

CONCLUSION

Results suggest that cartilage degeneration is slowed through weight loss in obese and overweight subjects over 96-months. This protective effect was, however, only found in subjects losing weight through diet and combined exercise and diet programs.

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 weight loss regimen is most beneficial in overweight and obese patients.