

Impact of Different Physical Activity Types on Longitudinal Knee Joint Health in Overweight and Obese Subjects: Data from the Osteoarthritis Initiative

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PURPOSE

To assess the impact of different types of physical activity types on longitudinal knee joint structural changes over 48 months in overweight and obese subjects.

METHOD AND MATERIALS

We included 415 subjects (59 years \pm 8.6; BMI 30 kg/m² \pm 3.5; 44% women) with a BMI \geq 25kg/ m² and knee radiographic Kellgren-Lawrence scores \leq 3 at baseline from the Osteoarthritis Initiative cohort. Regular self-reported participation in the following six physical activity types was assessed: ball sports, bicycling, jogging/running, elliptical-trainer, racquet sports and swimming. Evaluation of structural knee abnormalities was performed using the modified Whole-Organ Magnetic Resonance Imaging Score (WORMS). Linear regression models were used to assess the associations between participation in different physical activity types and changes in WORMS. Bonferroni-correction was performed to correct for multiple comparisons.

RESULTS

Over 48 months the overall WORMS score increased significantly more in subject regularly participating in racquet sports compared to subject regularly using the elliptical trainer (average difference in changes in WORMS scores: 4.98; [95% CI]: [1.86,8.10]; $p < 0.001$). Moreover, the overall WORMS score increased significantly more in the racquet sports group compared to the jogging/running group (2.88[0.42,5.33]; $p = 0.009$). The cartilage sum score increased significantly more in the racquet sports group compared to the elliptical-trainer group (2.20 [0.59,3.81]; $p = 0.001$), likewise there was a significant greater increase in the medial tibial cartilage compartment (0.73; [0.16,1.30]; $p = 0.003$).

CONCLUSION

Progression of knee joint degeneration was consistently higher in obese subjects engaging in racquet sports. Subjects using the elliptical trainer showed the smallest changes in structural degeneration over 48 months.

CLINICAL RELEVANCE/APPLICATION

Overweight and obese subjects could benefit from low impact physical activities, especially exercising with elliptical trainer in order to slow progression of knee joint degeneration and cartilage defects.