

No Changes in Appetite Stimulating Hormones Following Swimming and Cycling Exercise Interventions

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ABSTRACT

Swimming is a favorable and ideal modality of exercise for individuals with obesity and arthritis as it encompasses a minimal weight-bearing stress and a reduced heat load. However, the available evidence indicates that regular swimming may not be effective in reducing body weight and body fatness. A current hypothesis is that exercise in cold water somehow stimulates appetite. **PURPOSE:** We determined the effect of swimming exercise training on fasting concentrations of ghrelin, insulin, leptin, and peptide YY in obese individuals with osteoarthritis. Cycling training was included as a non-weight bearing land-based comparison group. **METHODS:** Thirty-nine obese participants with osteoarthritis (age=59±1 years, BMI=33±1 kg/m²) were randomly assigned to 12 weeks of supervised swimming training (N=19) or cycling training (N=20). In the initial few weeks, participants exercised for 20-30 minutes/day, 3 days/week, at an exercise intensity of 40-50% of heart rate reserve (HRR). Subsequently, the intensity and duration of exercise were progressively increased to 40-45 minutes/day, 3 days/week, at an intensity of 60-70% of HRR. Fasting blood samples were analyzed for ghrelin, insulin, leptin, and peptide YY concentrations using ELISAs. **RESULTS:** There were no group differences in body weight, BMI, or appetite stimulating hormones prior to the exercise interventions. Fasting plasma concentrations of ghrelin (37±8 vs. 42±11 pg/ml), insulin (1,176±424 vs. 1,179±442 pg/ml), leptin (20,200±2,891 vs. 16,617±2,734 pg/ml), and peptide YY (51±6 vs. 54±7 pg/ml) did not change with the swimming exercise intervention (all p>0.05). Similarly, cycling exercise had no effect on ghrelin (36±10 vs. 44±8 pg/ml), insulin (978±321 vs. 964±311 pg/ml), leptin (29,261±5,438 vs. 26,308±4,771 pg/ml), or peptide YY (58±15 vs. 63±16 pg/ml) concentrations (all p>0.05). **CONCLUSION:** Our present results indicate that fasting levels of appetite stimulating hormones did not change with 12 weeks of swimming exercise intervention in obese participants with osteoarthritis and that there were no group differences in changes in these hormones between swimming and cycling exercise interventions.