

Influence of Aerobic Exercise on Ghrelin-o-Acyltransferase in Normal Weight and Obese Adults: A Pilot Study

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Obesity is a major public health issue in the United States (US), affecting an estimated 78 million US adults. Aerobic exercise (AE) is recommended by the American College of Sports Medicine to prevent and treat obesity, yet the effect of AE on circulating hunger hormones, including ghrelin and its biological catalyst, ghrelin-o-acyltransferase (GOAT), are less known. **PURPOSE:** To determine the influence of AE on circulating GOAT in normal weight and obese adults.

METHODS: A preliminary power analysis was performed to detect a medium to large effect size with 80% power. A sample size of nine was determined to be able to detect a medium effect size of 0.50 with 84% power, and was used as the pilot sample for this study. Of the pilot sample, four were normal weight (NW) (body mass index [BMI] = $21.3 \pm 1.3 \text{ kg/m}^2$) and five were obese (OB) (BMI = $38.9 \pm 6.2 \text{ kg/m}^2$). Physical characteristics were measured at baseline with a health fitness assessment. Participants then returned to the laboratory on three separate occasions, separated by ≥ 48 hours to perform AE and control sessions in a random counter-balanced order. AE sessions were performed on cycle ergometers at 30% and 60% oxygen uptake reserve for 40 minutes. Control sessions were performed with seated rest and no AE for 40 minutes. Fifteen mL of blood was taken pre-and-post-AE and pre-and-post-control, and were assayed in duplicate. Mixed factorial analysis of variance (ANOVA) was used to determine whether mean differences existed between NW and OB for GOAT in response to AE and control. Alpha levels were set *a priori* at $p < 0.05$. **RESULTS:** No significant mean difference was found between NW and OB ($F[1, 4] = 0.66, p = 0.44$) AE and control ($F[2, 4] = 0.05, p = 0.96$), or the interaction between body weight and treatment condition ($F[1, 8] = 0.75, p = 0.49$). **CONCLUSION:** We found the change in GOAT to be similar between NW and OB across treatment and control conditions in this pilot study. Our findings indicate that further investigation of GOAT is warranted in combination with other appetite regulating hormones in response to exercise. Such investigations should expand upon our findings and implement study designs that include larger samples of men and women to better understand the role GOAT may play as a biological catalyst in the suppression of appetite.

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