

The Effect of Gender on Circulating Adipokines during Weight Loss and Weight Maintenance

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ABSTRACT

During obesity, the altered release of adipokines, leptin and adiponectin, have been strongly associated with development of the metabolic syndrome. Treatment with weight loss has been shown to increase adiponectin, in particular high molecular weight (HMW) adiponectin, and reduce circulating leptin levels indicating an increased leptin sensitizing effect. Interestingly, a gender dichotomy has been identified with women generally possessing higher plasma concentrations of both adipokines. Weight loss effects have been well established; however, it remains to be determined how the gender differences in adiponectin and leptin will affect these adipokines during prolonged weight maintenance. **PURPOSE:** To identify gender differences in adiponectin and leptin concentrations following a 6-month weight loss and weight maintenance program. **METHODS:** Sixty-five obese (mean±SEM; age=47.9±1.1 years; BMI=34.3±0.7 kg/m²;) adults (M=20, F=45) completed a 3-month weight loss program that consisted of a reduced energy intake of 1200-1500 kcals/day using a high-volume low-calorie diet combined with a progressive walking program to target 300 min/wk. During the 3-month weight maintenance program, participants consumed sufficient calories to maintain weight loss with continued walking to target 300 min/wk. Fasted (12 hr) blood samples were collected at baseline, post- weight loss (3 months), and weight maintenance (6 months) and assayed for glucose, insulin, total and HMW adiponectin, and leptin. To identify significant changes over time and between gender, a repeated measures (time x gender) ANOVA was performed with significance set at P<0.05. **RESULTS:** At baseline, no significant difference in BMI or HOMA-IR were observed between genders. Following 3 months of weight loss, BMI was significantly reduced 9.9% and 8.5% in men and women, respectively, and BMI remained unchanged through the weight maintenance program. Interestingly, only men demonstrated a significant reduction in HOMA-IR following weight loss. Following weight maintenance in women, HOMA-IR increased slightly such that it was not significantly different than the baseline or weight loss time points. At baseline, women had significantly higher circulating levels of total and HMW adiponectin, and leptin. No significant changes in total or HMW adiponectin were observed over time for either gender. Following weight-loss, leptin concentrations were reduced 49.6% and 39.2% in men and women, respectively. Interestingly, only women demonstrated a transient reduction in leptin through the weight maintenance program. **CONCLUSIONS:** At baseline, we identified the presence of a clear gender dichotomy for total and HMW adiponectin, and leptin concentrations. Despite these significant differences in circulating adipokines at baseline, both men and women responded similarly to a 6-month weight loss and weight maintenance program.