

# Abstract

Nutr Res. 2010 Apr;30(4):227-32.

## Associations between obesity and serum lipid-soluble micronutrients among premenopausal women.

Chai W, Conroy SM, Maskarinec G, Franke AA, Pagano IS, Cooney RV.

Cancer Research Center of Hawaii, University of Hawaii, Honolulu, HI 96813, USA.

**BACKGROUND:** Elucidating potential pathways that micronutrients may reduce/promote chronic disease may contribute to our understanding of the underlying etiology of disease and their utility as markers of risk.

**OBJECTIVE AND METHODS:** In the current study, we examined associations of serum lipid-soluble micronutrients with body mass index (BMI). We hypothesized that obesity may differentially influence serum micronutrient levels, thereby affecting risk for chronic disease incidence and mortality. Baseline serum samples from 180 premenopausal women from a nutritional trial were analyzed for leptin, C-reactive protein, 25-hydroxyvitamin D, carotenoids, and tocopherols. Participants were stratified into normal-weight (18.5-24.9), overweight (25-29.9), and obese ( $\geq 30$ ) subgroups by BMI (in kilograms per square meter). Differences in serum biomarkers among BMI subgroups were adjusted for Asian ethnicity and smoking status.

**RESULTS:** As expected, obese individuals had significantly higher serum levels of leptin and C-reactive protein ( $P < .05$ ) compared with normal-weight women. gamma-Tocopherol levels were significantly higher in obese individuals ( $P < .05$ ), whereas alpha-tocopherol levels did not differ among BMI subgroups. Serum levels of 25-hydroxyvitamin D and carotenoids (except lycopene) were significantly lower in obese than in normal-weight women ( $P < .05$ ). The associations between BMI and carotenoids were independent of dietary intake. The obesity-associated reduction for total provitamin A carotenoids (45%) was approximately 3-fold greater than that observed for non-provitamin A carotenoids (16%).

**CONCLUSIONS:** Our results indicate potential influences of obesity on serum levels of lipid-soluble micronutrients and suggest that metabolism of provitamin A carotenoids may contribute to the differences observed.

PMID: 20534324