Effects of Consuming Almonds on Insulin Sensitivity and Other Cardiometabolic Health Markers in Adults With Prediabetes

Abstract:
This study was designed to assess the effects of replacing high-carbohydrate (CHO) foods with raw almonds on insulin sensitivity and cardiometabolic health markers in overweight or obese adults with prediabetes. This randomized crossover study consisted of two 6-week dietary intervention periods, separated by a ≥ 4-week washout. Subjects incorporated 1.5 oz of raw almonds twice daily or isocaloric CHO-based foods into their diets, with instructions to maintain body weight. Dietary intakes as well as insulin sensitivity, CHO metabolism indices, lipoprotein lipids and particles, and inflammatory markers were assessed. Thirty-three subjects (17 male, 16 female), mean age 48.3 ± 2.2 years and body mass index 30.5 ± 0.7 kg/m2, provided evaluable data. Compared to CHO, almonds resulted in significantly ($p < 0.01$) higher intakes of protein, fat (unsaturated fatty acids), fiber, and magnesium and significantly ($p < 0.001$) lower intakes of CHO and sugars. No differences were observed between diet conditions for changes from baseline in the insulin sensitivity index from a short intravenous glucose tolerance test or other indices of glucose homeostasis. No significant differences were observed in biomarkers of cardiovascular risk except that the CHO intervention led to a shift toward a higher concentration of cholesterol in small, dense low-density lipoprotein subfraction 3+4 (LDL3 + 4) particles ($p = 0.024$ vs almonds). Intake of 3.0 oz/d raw almonds, vs energy-matched CHO foods, improved the dietary nutrient profile, but did not significantly affect insulin sensitivity and most markers of cardiometabolic health in overweight and obese men and women with prediabetes.

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