

Abstract

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Plasma 25-hydroxyvitamin d is associated with markers of the insulin resistant phenotype in nondiabetic adults.

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OBJECTIVE: We examined the cross-sectional association between plasma 25-hydroxyvitamin D [25(OH)D] and markers of the insulin resistant phenotype.

METHODS: Plasma 25(OH)D concentrations were measured in 808 nondiabetic participants of the Framingham Offspring Study. Outcome measures included fasting and 2-h post 75-g oral glucose tolerance test (OGTT) glucose and insulin; these were used to calculate the homeostatic model assessment-insulin resistance (HOMA-IR) and insulin sensitivity index (ISI(0,120)). We also measured plasma adiponectin, triacylglycerol, and HDL cholesterol concentrations as markers of the insulin-resistant phenotype.

RESULTS: After adjusting for age, sex, BMI, waist circumference, and current smoking status, plasma 25(OH)D concentration was inversely associated with fasting plasma glucose and insulin concentrations, and HOMA-IR. Compared with the participants in the lowest tertile category of plasma 25(OH)D, those in the highest tertile category had a 1.6% lower concentration of fasting plasma glucose (P-trend = 0.007), 9.8% lower concentration of fasting plasma insulin (P-trend = 0.001), and 12.7% lower HOMA-IR score (P-trend < 0.001). After adjusting for age and sex, plasma 25(OH)D was positively associated with ISI(0,120), plasma adiponectin, and HDL cholesterol and inversely associated with plasma triacylglycerol, but these associations were no longer significant after further adjustment for BMI, waist circumference, and current smoking status. 25(OH)D and 2-h post-OGTT glucose were not associated. Among adults without diabetes, vitamin D status was inversely associated with surrogate fasting measures of insulin resistance.

CONCLUSION: These results suggest that vitamin D status may be an important determinant for type 2 diabetes mellitus.

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