

Abstract

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Vitamin D is associated with atheroprotective high-density lipoprotein profile in postmenopausal women.

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BACKGROUND: Low vitamin D has been associated with low levels of high-density lipoprotein (HDL) cholesterol, a marker of coronary risk. Whether atheroprotective HDL particle composition accounts for this association and whether fat affects this association is not known.

OBJECTIVE: To explore the association between HDL particle composition and 25-hydroxy vitamin D (25[OH]D) in post-menopausal women.

METHODS: Vitamin D levels and lipoprotein composition were assessed in fasting blood samples of apparently healthy women from a diverse Chicago community. Visceral (VAT) and subcutaneous (SAT) abdominal fat area were assessed using computed tomography. Total body fat mass was measured by dual-energy X-ray absorptiometry.

RESULTS: We enrolled 78 women (50% black; 50% white), age 48 to 64 years, all of whom were participants in a longitudinal study of fat patterning. They had a mean 25[OH]D of 31 ± 15 $\mu\text{g/L}$, HDL cholesterol 57 ± 11 mg/dL, and large HDL particle subclass 8.6 ± 3.4 $\mu\text{mol/L}$. In a multivariable-adjusted regression model, each 5 $\mu\text{g/L}$ higher 25[OH]D predicted 0.57 $\mu\text{mol/L}$ (95%CI 0.20-0.95) higher large HDL particles, independent of race, season, and total HDL particle concentration. This association was only partially confounded by total body fat mass (0.49, 95%CI 0.10-0.89), SAT (0.50, 95%CI 0.11-0.90), or VAT (0.37, 95%CI 0.01-0.74). Age did not significantly influence the strength of associations.

CONCLUSIONS: Higher 25[OH]D levels are associated with large HDL particles. This association is stronger than that of HDL cholesterol and only partially confounded by body fat. Theoretically, vitamin D may protect against cardiovascular risk by promoting formation of large HDL particles, affecting reverse cholesterol transport.

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