Abstract

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Serum 25-Hydroxyvitamin D Has a Modest Positive Association with Leukocyte Telomere Length in Middle-Aged US Adults.

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BACKGROUND: Vitamin D deficiency has been linked to all-cause mortality and cancer. However, the biological plausibility of these associations is not well established. Leukocyte telomere length (LTL) shortening is associated with aging and is a hallmark of genomic instability and carcinogenesis.

OBJECTIVE: We aimed to investigate the association between serum 25-hydroxyvitamin D [25(OH)D] concentrations and LTL in the general US population.

METHODS: We analyzed data from the US NHANES 2001-2002. The study population comprised 1542 younger adults (aged 20-39 y), 1336 middle-aged adults (aged 40-59 y), and 1382 older adults (aged ≥60 y). LTL was measured by using quantitative polymerase chain reaction. Serum 25(OH)D concentrations ≥50 nmol/L were considered optimal. Linear regression, adjusted for age, sex, race/ethnicity, body mass index (BMI), total energy and sugar intakes, calcium intake, socioeconomic status, milk and dietary supplement consumption, and physical activity, was applied to investigate the association between serum 25(OH)D and LTL.

RESULTS: In the total population, age, sex, BMI, and non-Hispanic black race/ethnicity were significant predictors of LTL. In the participants aged 40-59 y, an increment in serum 25(OH)D of 10 nmol/L was associated with a 0.03- ± 0.01-kbp longer LTL, adjusted for age, sex, race/ethnicity, and other factors (P = 0.001). In the same age group, 25(OH)D concentrations ≥50 nmol/L were associated with a 0.13- ± 0.04-kbp longer LTL than those for 25(OH)D concentrations <50 nmol/L (P = 0.01). The association was independent of age, sex, race/ethnicity, BMI, and other factors.

CONCLUSIONS: In a nationally representative population of adults, serum 25(OH)D was positively associated with LTL in middle-aged participants (aged 40-59 y), independently of other factors. These findings suggest that decreased 25(OH)D concentrations are associated with genomic instability, although the clinical impact of this observation remains unclear.

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