Plasma vitamin D biomarkers and leukocyte telomere length

Abstrak

Vitamin D may reduce telomere shortening through anti-inflammatory and anti-cell proliferation mechanisms. In the present study, we examined the association between vitamin D and relative leukocyte telomere length by using both plasma 25-hydroxyvitamin D (25(OH)D) and 1,25-dihydroxyvitamin D (1,25(OH)2D) biomarkers. Vitamin D biomarker levels and leukocyte telomere length were measured using plasma samples collected in 1989-1990 from participants of the Nurses' Health Study, a study of nurses from 11 US states. In total, 1,424 participants had their 25(OH)D levels assessed and 837 had their 1,25(OH)2D levels assessed. Genotyping was performed on 480 participants on 12 single nucleotide polymorphisms in vitamin D-related genes. Linear and logistic regression models were used. Higher 25(OH)D levels were significantly associated with longer telomere length (P for trend = 0.05), and the odds ratio increased from 1.07 (P = 0.65) when comparing the second lowest quartile of 25(OH)D with the lowest to 1.59 (P = 0.01) when comparing the highest quartile with the lowest. Vitamin D-related single nucleotide polymorphisms and 1,25(OH)2D levels were not significantly associated with telomere length. Total calcium intake significantly modified the association between 25(OH)D and telomere length (P for interaction = 0.05). Higher plasma 25(OH)D levels may be associated with longer telomeres, and this association may be modified by calcium intake.