

Abstract

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Pharmacokinetics of a single, large dose of cholecalciferol.

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BACKGROUND: There is much interest in dosing vitamin D intermittently for patient convenience and long-term adherence.

OBJECTIVE: The objective was to characterize the time course and response of 25-hydroxyvitamin D (calcidiol) to a large oral dose of cholecalciferol.

DESIGN: One group (30 subjects) was supplemented with a single oral dose of 100,000 IU cholecalciferol. A second group (10 subjects) served as a control group to assess the seasonal change of calcidiol. Serum calcidiol concentrations were followed for 4 mo. The subjects were healthy with limited sun exposure (<10 h/wk) and milk consumption (<0.47 L daily). We excluded subjects with granulomatous conditions, liver disease, kidney disease, or diabetes and subjects taking anticonvulsants, barbiturates, or steroids.

RESULTS: Serum calcidiol rose promptly after cholecalciferol dosing from a mean (+/-SD) baseline of 27.1 +/- 7.7 ng/mL to a concentration maximum of 42.0 +/- 9.1 ng/mL. Seven percent of the supplemented cohort failed to achieve 32.1 ng/mL at any time point. The highest achieved concentration in any subject was 64.2 ng/mL. The control group had a nonsignificant change from baseline of -0.72 +/- 0.80 ng/mL during 4 mo.

CONCLUSIONS: Cholecalciferol (100,000 IU) is a safe, effective, and simple way to increase calcidiol concentrations. The dosing interval should be < or =2 mo to ensure continuous serum calcidiol concentrations above baseline. This trial was registered at www.clinicaltrials.gov as #NCT00473239.

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