Abstract

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Vitamin D3 Is More Potent Than Vitamin D2 in Humans.

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BACKGROUND: Current unitage for the calciferols suggests that equimolar quantities of vitamins D2 (D2) and D3 (D3) are biologically equivalent. Published studies yield mixed results.

OBJECTIVE: The aim of the study was to compare the potencies of D2 and D3.

DESIGN: The trial used a single-blind, randomized design in 33 healthy adults. Calciferols were dosed at 50,000 IU/wk for 12 wk. Principal outcome variables were area under the curve for incremental total 25-hydroxyvitamin D [25(OH)D] and change in calciferol content of sc fat.

RESULTS: Incremental mean (SD) 25(OH)D area under the curve at 12 wk was 1366 ng · d/ml (516) for the D2-treated group and 2136 (606) for the D3 (P < 0.001). Mean (SD) steady-state 25(OH)D increments showed similar differences: 24 ng/ml for D2 (10.3) and 45 ng/ml (16.2) for D3 (P <0.001). Subcutaneous fat content of D2 rose by 50 μg/kg in the D2-treated group, and D3 content rose by 104 μg/kg in the D3-treated group. Total calciferol in fat rose by only 33 ng/kg in the D2-treated, whereas it rose by 104 μg/kg in the D3-treated group. Extrapolating to total body fat D3, storage amounted to just 17% of the administered dose.

CONCLUSION: D3 is approximately 87% more potent in raising and maintaining serum 25(OH)D concentrations and produces 2- to 3-fold greater storage of vitamin D than does equimolar D2. For neither was there evidence of sequestration in fat, as had been postulated for doses in this range. Given its greater potency and lower cost, D3 should be the preferred treatment option when correcting vitamin D deficiency.

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