

Correlation between vitamin D intake and serum 25(OH) vitamin D₃ levels in women of the St. Benedict Monastery ages 59-89

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Introduction:

- Vitamin D deficiency is prevalent among the elderly
- Serum vitamin D levels were less than optimal in 79% of Americans age 55-74⁽¹⁾
- US Dietary Guidelines: 600 IU/day for people less than 70 and 800 IU/day for people 70 and over
- Sun exposure is the ideal way to synthesize pre-vitamin D₃ but sun rays are insufficient during winter
- Activation of pre-vitamin D₃ diminishes with age
- Vitamin D status is associated with bone health (density and quality) and muscle strength



Purpose:

- Correlate vitamin D status [serum 25(OH)D₃] with vitamin D intake from diet and supplements



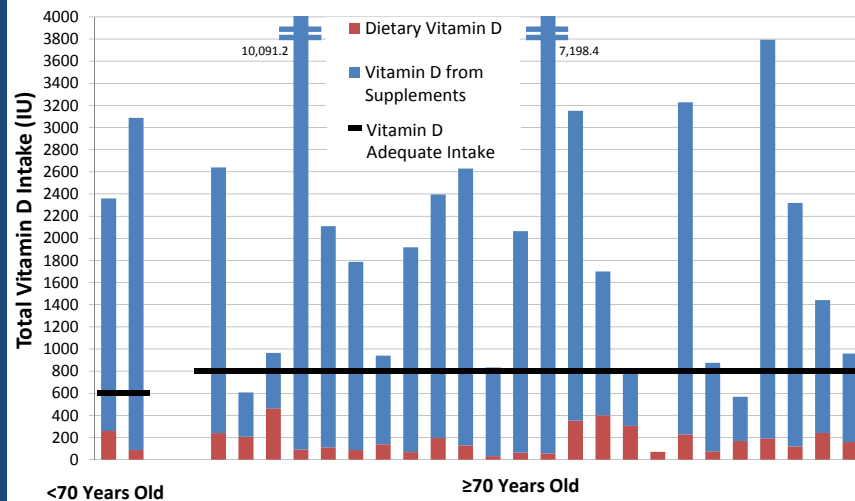
Methods:

- Approved by CSB/SJU Institutional Review Board December 2010
- Recruited 26 subjects
- Conducted meal observations for five days (Tues-Sat)
- Documented food selections with menu-tracking forms and photographed trays to assess food choices and portion sizes
- Subjects recorded breakfast and snacks individually
- Measured serum 25(OH)D₃ with ALPCO Vitamin D direct ELISA kit
- Used Diet Analysis Plus to assess the diet



(1) Brock, K., Huang, W.Y., Fraser, D. R., Ke, L., Tseng, M., Stenzenberg-Solomon, R. et al. (2010). Low vitamin D status is associated with physical inactivity, obesity and low vitamin D intake in a large US sample of healthy middle-aged men and women. *Journal of Steroid Biochemistry & Molecular Biology*, 121, 462-466.

Dietary and Supplemental Vitamin D Intake for Each Subject Separated by Age Group



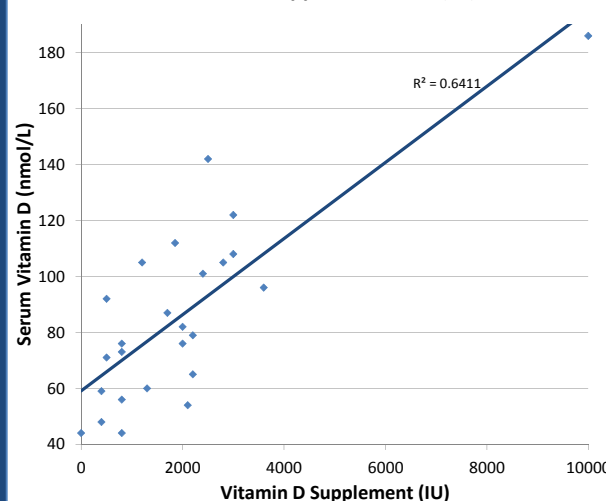
Results:

- 25 of 26 subjects were taking supplements
- Subjects did not meet dietary recommendations through food sources alone
- Average intake of vitamin D from the diet was 175±112 IU/day (AI= 600 IU for under 70 years, 800 IU for 70 and older)
- Subjects averaged 22% of the recommended daily value from diet
- On average, vitamin D deficient subjects took 600±283 IU/day of vitamin D supplements, vitamin D insufficient subjects took 990±737 IU/day, and subjects with optimal vitamin D levels took 2637±2204 IU/day
- The serum vitamin D of 42% of subjects was either deficient or insufficient
- Strong correlation between supplementation and vitamin D serum levels ($r=0.79$)

Conclusions:

- 84% of the women taking at least 2000 IU/day had optimal serum 25(OH)D₃ levels
- 50% of those supplementing with between 500 and 2000 IU/day had optimal serum 25(OH)D₃ levels
- 25% of those supplementing with less than 500 IU/day had optimal serum 25(OH)D₃ levels
- Elderly women living in central Minnesota appear to need 2000 IU of supplemental vitamin D daily to achieve optimal serum levels during winter months

Serum 25(OH)D₃ (nmol/L) Compared to Vitamin D Supplementation (IU)



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