



**Universität
Zürich**^{UZH}

Institut für Hausarztmedizin

Oral vitamin D – Is it necessary to be taken with meals containing fat?
An Open-Label, Crossover Study

Markus Gnädinger, Frank Bossert, Felix Eichmann, Bruno Haug, Martin Krüsi, Markus Nadig, Stefan Pazeller, Theo Ringli, Martin Ruppli, Michel Salzgeber, Ivo Schmid, Roman Schöb, Bernhard Wälti, Markus Zeller
Quality Circle Oberthurgau, Switzerland

Summary

Vitamin D is highly apolar and belongs to the class of fat-soluble vitamins. It is suggested to take them with meals containing fat to enhance their intestinal resorption. However, there are only a few controlled studies which investigate postprandial inferences on its resorption.

Subjects and Methods

Within a group of general practitioners, during a period of three months, we ran two identical study protocols during winter and early spring time. Blood was taken from the subjects, 60'000 units of vitamin D (cholecalciferol) was ingested, and blood sampled once again a week later. One time the vitamin was ingested postprandial, and another time in a fasting state. 25-hydroxyvitamin D was determined by ADVIA CENTAUR vitamin D total.

Results

| | |
|------------------------------------|----------------------------|
| Age, years | 54 (51;57) |
| Body mass index, kg/m ² | 23.1 (21.8;24.4) |
| Blood pressure, mmHg | 129 / 84 (119;140 / 78;89) |
| Heart rate, min ⁻¹ | 68 (62;74) |
| Serum calcium, mmol/l | 2.39 (2.33;2.44) |
| Serum phosphate, mmol/l | 1.1 (1.0;1.2) |
| Serum albumin, g/l | 44 (43;45) |
| 25-hydroxyvitamin D, nmol/l | 41.1 (32.4;50.0) |
| 1,25-dihydroxyvitamin D, ng/l | 38.1 (31.7;44.5) |

Table: Basal values of participants (mean value, 95% confidence interval)

The basal levels of 25-hydroxyvitamin D were 41 (32;50) nmol/l (mean, 95% CI). When the supplement was ingested in a fasting state, serum 25-hydroxyvitamin D was increased by 15 (5;24), while taken after a meal containing fat, the rise was 23 (15;33) nmol/l (n.s., p=0.13). The other parameters which were tested were unchanged throughout the study: calcium, phosphate, albumin, 1,25-dihydroxyvitamin D (calcitriol).

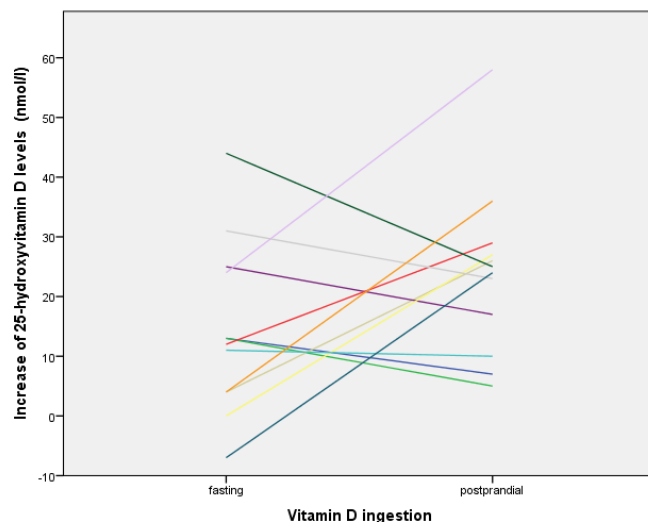


Figure: Individual increases of serum 25-hydroxyvitamin D after 8 days as compared to pre-dosage levels (n=12)

Discussion

The results of our study do not support major influences on vitamin D resorption by the influence of fasting vs. concomitant fatty meal intake. Resorption of vitamin D seems to be unpredictable – fractionate dosage and determination of serum levels during treatment may be helpful. Unexplained low vitamin D after repeated supplementation could be due to intestinal disease, mainly celiac.

Correspondence: markus.gnaedinger@hin.ch