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ORIGINAL RESEARCH COMMUNICATION

Vitamin D and calcium supplementation reduces cancer risk: results of a randomized trial^{1,2}

Joan M Lappe, Dianne Travers-Gustafson, K Michael Davies,
Robert R Recker and Robert P Heaney

¹ From the Osteoporosis Research Center, Creighton University, Omaha, NE

Background: Numerous observational studies have found supplemental calcium and vitamin D to be associated with reduced risk of common cancers. However, interventional studies to test this effect are lacking.

Objective: The purpose of this analysis was to determine the efficacy of calcium alone and calcium plus vitamin D in reducing incident cancer risk of all types.

Design: This was a 4-y, population-based, double-blind, randomized placebo-controlled trial. The primary outcome was fracture incidence, and the principal secondary outcome was cancer incidence. The subjects were 1179 community-dwelling women randomly selected from the population of healthy postmenopausal women aged >55 y in a 9-county rural area of Nebraska centered at latitude 41.4°N. Subjects were randomly assigned to receive 1400–1500 mg supplemental calcium/d alone (Ca-only), supplemental calcium plus 1100 IU vitamin D₃/d (Ca + D), or placebo.

Results: When analyzed by intention to treat, cancer incidence was lower in the Ca + D women than in the placebo control subjects ($P < 0.03$). With the use of logistic regression, the unadjusted relative risks (RR) of incident cancer in the Ca + D and Ca-only groups were 0.402 ($P = 0.01$) and 0.532 ($P = 0.06$), respectively. When analysis was confined to cancers diagnosed after the first 12 mo, RR for the Ca + D group fell to 0.232 (CI: 0.09, 0.60; $P < 0.005$) but did not change significantly for the Ca-only group. In multiple logistic regression models, both treatment and serum 25-hydroxyvitamin D concentrations were significant, independent predictors of cancer risk.

Conclusions: Improving calcium and vitamin D nutritional status substantially reduces all-cancer risk in postmenopausal women. This trial was registered at clinicaltrials.gov as NCT00352170.

Key Words: Serum 25-hydroxyvitamin D • cancer • women • calcium and vitamin D₃ supplementation

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