

ORIGINAL RESEARCH COMMUNICATION

High prevalence of low dietary calcium, high phytate consumption, and vitamin D deficiency in healthy south Indians^{1,2}

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Background: Data on the vitamin D status of the population in a tropical country such as India have seldom been documented. Vitamin D deficiency is presumed to be rare.

Objective: The objective was to document the dietary habits and concentrations of serum calcium, 25-hydroxyvitamin D [25(OH)D], and parathyroid hormone of Indian urban and rural populations.

Design: Healthy urban ($n = 943$) and rural ($n = 205$) subjects were studied for their dietary pattern and concentrations of serum calcium, phosphorus, alkaline phosphatase, 25(OH)D, and immunoreactive parathyroid hormone.

Results: The daily dietary calcium intake of both the urban and rural populations was low compared with the recommended dietary allowances issued by the Indian Council of Medical Research. Dietary calcium and phosphorus were significantly lower in rural adults than in urban adults ($P < 0.0001$). The dietary phytate-to-calcium ratio was higher in rural subjects than in urban subjects ($P < 0.0001$). The 25(OH)D concentrations of the rural subjects were higher than those of urban subjects ($P < 0.001$), both men and women. In the rural subjects, 25(OH)D-deficient (<20 ng/mL), -insufficient (20–30 ng/mL), and -sufficient (>30 ng/mL) states were observed in 44%, 39.5%, and 16.5% of the men and 70%, 29%, and 1% of the women, respectively. In the urban subjects, 25(OH)D-deficient, -insufficient, and -sufficient states were observed in 62%, 26%, and 12% of the men and 75%, 19%, and 6% of the women, respectively.

Conclusions: Low dietary calcium intake and 25(OH)D concentrations were associated with deleterious effects on bone mineral homeostasis. Prospective longitudinal studies are required to assess the effect on bone mineral density, a surrogate marker for fracture risk and fracture rates.

Key Words: Dietary calcium • phytate consumption • vitamin D insufficiency • bone mineral density • Indians • high prevalence

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