

Differential effects of calcium- and vitamin D-fortified milk with FOS-inulin compared to regular milk, on bone biomarkers in Chinese pre- and postmenopausal women

ABSTRACT

PURPOSE:

To compare the effects of a high-calcium vitamin D-fortified milk with added FOS-inulin versus regular milk on serum parathyroid hormone, and bone turnover markers in premenopausal (Pre-M) and postmenopausal (PM) women over 12 weeks.

METHODS:

Premenopausal women (n = 136, mean age 41 (\pm 5) years) and postmenopausal women [n = 121, mean age 59 (\pm 4) years] were recruited, and each age group randomised into two groups to take two glasses per day of control = regular milk (500 mg calcium per day) or intervention (Int) = fortified milk (1000 mg calcium for pre-M women and 1200 mg calcium for PM women, 96 mg magnesium, 2.4 mg zinc, 15 μ g vitamin D, 4 g FOS-inulin per day). At baseline, week 4 and week 12 serum minerals and bone biochemical markers were measured and bone density was measured at baseline.

RESULTS:

Mean 25-hydroxyvitamin D [25(OH) vitamin D3] levels among groups were between 49 and 65 nmol/L at baseline, and over the 12 weeks of supplementation, the fortified milk improved vitamin D status in both Int groups. CTx-1 and PINP reduced significantly in both Pre-M and PM groups over the 12 weeks, with the changes in CTx-1 being significantly different ($P < 0.035$) between PM control and PM Int groups at week 12. Parathyroid hormone levels were significantly reduced in all groups over time, except for control PM group where levels increased at 12 weeks.

CONCLUSION:

The overall pattern of responses indicates that while both regular milk and fortified milk reduce bone resorption in young and older women, fortified milk is measurably more effective.

Keyword: 25(OH) vitamin D3; Bone markers; Bone turnover; Calcium-fortified milk; Chinese women; Malaysia; Postmenopausal women; Premenopausal women; Vitamin D status