Choline-stabilized orthosilicic acid supplementation as an adjunct to calcium/vitamin D3 stimulates markers of bone formation in osteopenic females: a randomized, placebo-controlled trial.

BMC Musculoskelet Disord. 2008 Jun 11;9:85.

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Abstract

BACKGROUND:

Mounting evidence supports a physiological role for silicon (Si) as orthosilicic acid (OSA, Si(OH)4) in bone formation. The effect of oral choline-stabilized orthosilicic acid (ch-OSA) on markers of bone turnover and bone mineral density (BMD) was investigated in a double-blind placebo-controlled trial.

METHODS:

Over 12-months, 136 women out of 184 randomized (T-score spine < -1.5) completed the study and received, daily, 1000 mg Ca and 20 microg cholecalciferol (Vit D3) and three different ch-OSA doses (3, 6 and 12 mg Si) or placebo. Bone formation markers in serum and urinary resorption markers were measured at baseline, and after 6 and 12 months. Femoral and lumbar BMD were measured at baseline and after 12 months by DEXA.

RESULTS:

Overall, there was a trend for ch-OSA to confer some additional benefit to Ca and Vit D3 treatment, especially for markers of bone formation, but only the marker for type I collagen formation (PINP) was significant at 12 months for the 6 and 12 mg Si dose (vs. placebo) without a clear dose response effect. A trend for a dose-corresponding increase was observed in the bone resorption marker, collagen type I C-terminal telopeptide (CTX-I). Lumbar spine BMD did not change significantly. Post-hoc subgroup analysis (baseline T-score femur < -1) however was significant for the 6 mg dose at the femoral neck (T-test). There were no ch-OSA related adverse events observed and biochemical safety parameters remained within the normal range.

CONCLUSION:

Combined therapy of ch-OSA and Ca/Vit D3 had a potential beneficial effect on bone collagen compared to Ca/Vit D3 alone which suggests that this treatment is of potential use in osteoporosis.