

Increased Calcium Absorption from Synthetic Stable ACC: Double-blind Randomized Crossover Clinical Trial in Post-menopausal Women

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ABSTRACT

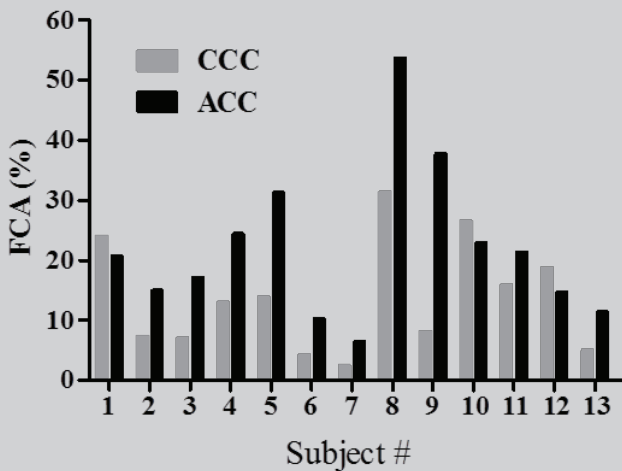
Calcium supplementation is a widely recognized strategy for achieving adequate calcium intake. Previous studies revealed comparable bioavailability of all currently commercially available calcium salts. We designed this blinded, randomized, crossover interventional trial to compare the bioavailability of a new stable synthetic amorphous calcium carbonate (ACC) with that of crystalline calcium carbonate (CCC) using the dual stable isotope technique. The study was conducted in the Unit of Clinical Nutrition, Tel Aviv Sourasky Medical Center, Israel. The study population included 15 early post-menopausal women aged 54.9 ± 2.8 (S.D.) years with no history of major medical illness or metabolic bone disorder, excess calcium intake or vitamin D deficiency.

Fractional calcium absorption (FCA) from amorphous calcium carbonate (ACC) vs. crystalline calcium carbonate (CCC) for each woman following 24-hour urine collection

 $n = 13$; Wilcoxon matched paired test, twotailed

 $p < 0.01$.

Standardized breakfast was followed by randomly provided CCC or ACC capsules containing 192 mg elemental calcium labeled with ^{44}Ca at intervals of at least 3 weeks. After swallowing the capsules, intravenous CaCl_2 labeled with ^{42}Ca on was administered on each occasion. Fractional calcium absorption (FCA) of ACC and CCC was calculated from the 24-h urine collection following calcium administration. The results indicated that FCA of ACC was doubled (± 0.96 SD) on average compared to that of CCC ($p < 0.02$). The higher absorption of the synthetic stable ACC may serve as a more efficacious way of calcium supplementation.



In summary, this study demonstrates a higher bioavailability of calcium from synthetic stable ACC compared to CCC. These results are intriguing in light of our recent findings in an ovariectomized rat model, which showed a beneficial effect of ACC over common calcium supplements on bone loss prevention, induction of bone formation and maintenance of bone mechanical strength