AlgaeCal Health Care Professionals

Examines the Effect of 3 AlgaeCal Formulations on Post-Menopausal Women's Bone Density at One Year

A Comparative Effectiveness Study of Bone Density Changes in Women Over 40 Following Three Bone Health Plans Containing Variations of the Same Novel Plant-Sourced Calcium. *Int J Med Sci.* 2011. PMID: 21448303.

Three groups of post-menopausal women each took different AlgaeCal formulations with all groups increasing bone density at one year. The smallest average increase among the 3 groups was 1.3% – an extraordinary result since traditional calcium supplements do not increase bone density.

This comparative effectiveness study measured bone density via DEXA scan at baseline and then again at 6 months and one year. AlgaeCal's results were compared to published data on traditional calcium supplements BMD scores. Post-menopausal women are expected to lose approximately 1% of bone density per year with traditional calcium supplements only slowing that rate of loss slightly.

Study Overview

Objectives

To conduct a Comparative Effectiveness Research (CER) study comparing changes in bone mineral density in healthy women over-40 with above-average compliance when following one of three bone health Plans.

Methods

Using an open-label sequential design, 414 females over 40 years of age were tested, 176 of whom agreed to participate and follow one of three different bone-health programs:

- **Plan 1** contained a bone-health supplement for 6 months with 51 completing the study per-protocol:
  - 1,000 IUs of vitamin D3
  - 750 mg of a plant-sourced form of calcium
  - 65 mg of magnesium
  - Pedometer–based activity program: NO
  - Health Literacy Information: NO
- **Plan 2** contained a bone-health supplement along with components designed to increase physical activity and health literacy for 1 year and 35 completing the study per-protocol:
  - 800 IU of vitamin D3
  - 756 mg of a plant-sourced form of calcium
  - 72 mg of magnesium
  - 1.5 mcg of vitamin K2 (as MK-7)
  - 680 mg of strontium citrate
  - Pedometer–based activity program: YES
  - Health Literacy Information: YES
- **Plan 3** contained a bone-health supplement along with components designed to increase physical activity and health literacy for 6 months and 125 completing the study per-protocol:
  - 1,600 IUs of vitamin D3
  - 720 mg of a plant-sourced form of calcium
  - 350 mg of magnesium
  - 100 mcg of vitamin K2 (as MK-7)
  - 50 mg of vitamin C

- 3 mg of boron
- 680 mg of strontium citrate
- Pedometer–based activity program: YES
- Health Literacy Information: YES

Each group completed the same baseline and ending DXA bone density scans, 43-chemistry blood test panels, and 84-item Quality of Life Inventory (QOL).

Comparisons were also made between the treatment groups and two theoretical age-adjusted expected groups: a non-intervention group and a group derived from a review of previously published studies on non-plant sources of calcium.

Components/ingredients in the three bone-health plans:

Ingredient or Component	Plan 1	Plan 2	Plan 3
Plant-Sourced Calcium (mg)	750	756	720
Trace Minerals in AlgaeCal (mg)	1,771	1,608	1,692
Magnesium (mg)*	65	72	350
Vitamin D3 (IUs of Cholecalciferol)	1,000	800	1,600
Vitamin K2 as MK-4 (mg)	0	1.5	0
Vitamin K2 as MK-7 (mcg)	0	0	100
Boron (mg)	0	0	3
Vitamin C (mg)	0	0	50
Strontium Citrate (mg)	0	680	680
Pedometer-Based Activity Program	No	Yes	Yes
Health Literacy Information	No	Yes	Yes

*72 mg naturally occurring plus magnesium chloride

Discussion

Within-group comparisons of changes in BMD from baseline and between-group comparisons with the two different expected change reference groups support the safety and efficacy of all three Plans.

It is also noteworthy that all three bone health plans facilitated outright increases in BMD, a finding that stands in marked contrast to a plethora of studies suggesting that calcium and vitamin D_3 supplementation can, at best, only slow down the age-related decline in BMD.

All three plans had an increase in MAPC:

- **Plan 1** = 1.3%
- **Plan 2** = 2.0%
- **Plan 3** = 4.1%

No statistical differences between the groups in BMDs or in variables affecting BMD (weight, gender, lean mass, % fat, and BMI), in any of the 43 baseline blood chemistries, or in the QOL analyses.

Additionally, there are studies supporting the suggestion that plant-sourced minerals may be more easily absorbed than non-plant-sourced calcium and minerals, and that the body is able to use less than 10 percent of the minerals contained in the most popular brands of multivitamins, as opposed to over 80 percent of minerals derived from plant sources.

Conclusions

This study found that following any of the three Plans was associated with increases in BMD as opposed to merely slowing down the decline in BMD, which had been the general conclusions from a wide range of studies on the efficacy of vitamin D and calcium supplementation. These increases occurred without adverse side effects.

While the study also provides evidence of the benefit of adding the physical activity and health literacy components, the data also support the efficacy of plant-source calcium as a stand-alone product.

Denotations

Plan 1: AlgaeCal Basic

Plan 3: AlgaeCal Plus with Strontium Boost