

Skeletal Benefits of Soy

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Date : June 18, 2019

There may be two important reasons for women with breast cancer to consume soy.

The skeletal benefits of soy have been investigated in earnest for 30 years. Attention focused first on the possible advantages of soy protein over animal protein^{1,2} and, second, on the estrogen-like effects of isoflavones.³ Recently reported 10-year follow up data from the Shanghai Breast Cancer Survival Study (SBCSS) show that higher soy intake was associated with a nearly 80% reduction in the risk of osteoporotic fractures among 1,900 premenopausal women.⁴ The size and duration of this study and robust findings from this high-soy-consuming cohort suggest the need to take another look at the proposed skeletal benefits of soy consumption.

The SBCSS is one of the largest cohort studies involving breast cancer patients and is one of the only cohorts of survivors to involve a high-soy consuming population.⁴ Plus, it is the only study to examine fracture risk in relation to soy intake among breast cancer survivors. So, it is rather unique. The high-soy consumption of this population is evident from the isoflavone intake tertile cutoffs (mg/d): low (

With the lowest intake set as the reference, the hazard ratios (95% confidence intervals) for osteoporotic fracture for the medium and high intake groups among premenopausal women were 0.79 (0.45, 1.41) and 0.22 (0.09, 0.53), respectively. These findings were adjusted for age at diagnosis, education, calcium supplement intake, tamoxifen usage, baseline fracture incidence, parity, aromatase inhibitor usage, and breast cancer stage. In contrast to premenopausal women, isoflavone intake was unrelated to fracture risk among postmenopausal women.

The findings from the SBCSS are striking, but they need perspective. Especially relevant in this regard, are the results of the Shanghai Women's Health Study (SWHS), an observational study involving approximately 24,000 postmenopausal women, which found that after a mean follow up period of 4.5 years, the relative risks (95% confidence intervals) of fracture were 1.00, 0.72 (0.62-0.83), 0.69 (0.59-0.80), 0.64 (0.55-0.76), and 0.63 (0.53-0.76) across quintiles of soy protein intake (P

The protective effect noted in SWHS among postmenopausal women contrasts with the lack of protection noted in the SBCSS. Although interestingly, in the SHWS, the multivariate relative risks (95% confidence intervals) of fracture comparing the extreme quintiles of soy protein intake were 0.52 (0.38-0.70) for women within 10 years of menopause vs 0.71 (0.56-0.89) for late postmenopausal women. Similar results were also found for isoflavone intake. So perhaps soy is more likely to be efficacious in pre-/peri- and early postmenopausal women than older women.

Regardless of the strengths of any observational study, definitive conclusions about efficacy are likely to be based on clinical data. Regarding soy and bone health, the clinical data overall are rather mixed. Furthermore, only one⁶ of the four longer-term trials (?2 years in duration) failed to find soy improved bone mineral density relative to placebo.⁷⁻⁹ However, none of these trials involved women with breast cancer and their duration was quite short relative to the 10-year follow up period in the SBCSS. Also, all four of the clinical trials intervened with isoflavone supplements, not soyfoods. Isoflavone exposure among women in the SBCSS and the SWHS was via soyfoods. Whether the source of isoflavones impacts bone health is unclear.

At this point, the jury is still out on the skeletal benefits of soy consumption. If the results of the SBCSS are confirmed by future research, the public health significance of this benefit is clearly very significant because some data show breast cancer survivors are more likely to experience a fracture than women without breast cancer.¹⁰ Furthermore, 4-year follow up data from the SBCSS showed post-diagnosis soy intake reduced recurrence and breast cancer-specific mortality.¹¹

References

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