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Assessment of soy phytoestrogens' effects on bone turnover indicators in menopausal women with osteopenia in Iran: a before and after clinical trial

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Abstract

Background

Osteoporosis is the gradual declining in bone mass with age, leading to increased bone fragility and fractures. Fractures in hip and spine are known to be the most important complication of the disease which leads in the annual mortality rate of 20% and serious morbidity rate of 50%. Menopause is one of the most common risk factors of osteoporosis. After menopause, sex hormone deficiency is associated with increased remodeling rate and negative bone balance, leading to accelerated bone loss and micro-architectural defects, resulting into increased bone fragility.

Compounds with estrogen-like biological activity similar to "Isoflavones" present in plants especially soy, may reduce bone loss in postmenopausal women as they are similar in structure to estrogens.

This research, therefore, was carried out to study the effects of Iranian soy protein on biochemical indicators of bone metabolism in osteopenic menopausal women.

Materials and methods

This clinical trial of before-after type was carried out on 15 women 45–64 years of age. Subjects were given 35 g soy protein per day for 12 weeks. Blood and urine sampling, anthropometric measurement and 48-h-dietary recalls were carried out at zero, 6 and 12 weeks. Food consumption data were analyzed using Food Processor Software. For the study of bone metabolism indicators and changes in anthropometric data as well as dietary intake, and repeated analyses were employed.

Results

Comparison of weight, BMI, physical activity, energy intake and other intervening nutrients did not reveal any significant changes during different stages of the study. Soy protein consumption resulted in a significant reduction in the urinary deoxypyridinoline and increasing of total alkaline phosphatase ($p < 0.05$), although the alterations in osteocalcin, c-telopeptide, IGFBP3 and type I collagen telopeptide were not significant.

Conclusion

In view of beneficial effect of soy protein on bone metabolism indicators, inclusion of this relatively inexpensive food in the daily diet of menopausal women, will probably delay bone resorption, thereby preventing osteoporosis.



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