IN VIVO AND IN VITRO STUDY OF THE EFFECT OF A TRADITIONAL CHINESE MEDICINE FORMULA ON POSTMENOPAUSAL OSTEOPOROSIS RAT MODEL

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ABSTRACT
Introduction
Osteoporosis (PMO) is a common disease affecting menopausal women. The use of traditional herbal medicines for the treatment of PMO has been widespread in China and claimed to be effective. There are no reliable clinical studies to substantiate these claims and no experimental studies to identify the physiological basis on which they are used.

Methods
We have set up the ovariectamized (OVX) rat model for PMO and tested the effect of a popular traditional Chinese medicine formula --- Bu Shen Bu Gu Tang (BSBGT), on prevention of ovariectomy-induced bone loss. Forty female SD rats were given either a sham operation or ovariectomy, twenty of which were daily given estrogen or BSBGT for 12 weeks after ovariectomy, totally making four groups --- the sham group, OVX group, estrogen group and BSBGT group, ten for each. Subsequently, bone mineral density (BMD), bone histomorphometric changes and collagen type I expression in the femur were accessed.

In order to position the target of the formula acting on bone, we have further elucidated the effect of BSBGT on regulation of mRNA levels of RANKL and OPG, two key factors essential for regulating osteoclastogenesis and bone resorption, by using rat calvarial-derived stromal cell cultures.

Results
The BSBGT formula was found as effective as estrogen in preventing the reduction of BMD, the trabecular area and trabecular numbers in femora and also the decrease of collagen type I expression.

RT-PCR results showed that both estrogen and BSBGT significantly up-regulated OPG mRNA level and down-regulated RANKL mRNA level, resulting in an increased ratio of OPG/RANKL in cultured rat stromal cells.

Discussion
We therefore concluded that the BSBGT formula might be as effective as estrogen in prevention of postmenopausal osteoporosis through the mechanism of up-regulating RANKL expression and down-regulating OPG expression in osteoblast/stromal cells.

REFERENCE

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