

In Vitro and In Vivo Anti-Osteoporotic Effect of Polygoni Multiflori Radix (PMR) Water Extracts

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Polygoni Multiflori Radix (PMR) a dried root tuber of *Polygonum multiflorum* Thunberg with bioactivities in bone metabolism is one of the most famous tonic traditional medicines in China, Japan and Korea. To observe the anti-osteoporotic effect of PMR, we observed the effects on proliferation and alkaline phosphatase (ALP) activity of primary osteoblasts, bone nodule formation, pit formation of osteoclasts and osteoclastogenesis in vitro, and for observe the in vivo efficacy PMR extracts were orally administered once a day for 28 days (Qd×28) to bilateral ovariectomized (OVX)-induced osteoporosis ddY mice after 1 week of recovery periods at 125, 250 and 500mg/kg (of body weight). A positive control drug group - Alendronate (FOSA), well-known a bisphosphonate anti-osteoporosis drug 10mg/kg-dosing group was added. Although PMR extracts did not influence the proliferation of primary osteoblasts, it enhanced the differentiation (ALP activity) and bone nodule formation of osteoblast. In addition, PMR extracts dose-dependently inhibits the pit formation and the number of multinucleated osteoclast-like cells (OCLs), osteoclastogenesis in vitro. As results of OVX-induced osteoporotic process, estrogen-deficient osteoporotic changes were also dramatically decreased in all PMR extracts-dosing groups, respectively. Although some favorable effects on the OVX-induced osteoporosis at 125mg/kg of PMR extracts-dosing groups, middle dosage of PMR extracts, 250mg/kg constantly and significantly ($p < 0.01$ or $p < 0.05$) inhibited the loss bone strength and bone quality. Based on the results, it was concluded that PMR extracts (125, 250 or 500mg/kg; orally dosing) has relatively good favorable effect to prevention and/or treatment of OVX-induced osteoporosis. Although the efficacy was slighter than that of FOSA on the inhibition of bone loss, it is expected that PMR extracts will be promising as a new anti-osteoporotic agents for prevent the fracture induced in osteoporotic patients because natural herbal medicine origin PMR extracts will be dose not show serious side effects especially the problem in upper alimentary irritation of bisphosphonate and hypercalcaemia of parathyroid hormone analogs.

Key words: Polygoni Multiflori Radix, ovariectomy, steoclast, osteoblast osteoporosis

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