NU-04

Biochanin A stimulates osteoblastic differentiation and inhibits hydrogen peroxide-induced production of inflammatory mediators in MC3T3-E1 cells

Eun-Mi Choi*, Sung-Ja Koo

Department of Food & Nutrition, Kyung Hee University, Seoul, Korea

Phytoestrogens, which have in part some structural similarity to 17β-estradiol, are reported to act as agonist/antagonist of estrogen in animals and humans. We examined the effects of biochanin A on the function of osteoblastic MC3T3-E1 cells and the production of local factors in osteoblasts. Biochanin A (1～50 μM) significantly increased the growth of MC3T3-E1 cells ($P<0.05$). Biochanin A (1～50 μM) caused a significant elevation of alkaline phosphatase (ALP) activity, collagen content, and osteocalcin secretion in the cells. The effect of biochanin A (10 μM) in increasing ALP activity and collagen content was completely prevented by the presence of 1 μM cycloheximide and 10 μM tamoxifen, suggesting that biochanin A's effect results from a newly synthesized protein component and might be partly involved in estrogen action. We then examined the effect of biochanin A on the H_2O_2-induced apoptosis and production of inflammatory mediators in osteoblasts. Treatment with biochanin A (50 μM) prevented apoptosis induced by 0.2 mM H_2O_2 in osteoblastic cells. Moreover, biochanin A (1～10 μM) decreased the 0.2 mM H_2O_2-induced production of TNF-α, IL-6, and NO in osteoblasts. These results suggest that biochanin A may be useful as potentail phytoestrogens, which play important physiological roles in the prevention of postmenopausal osteoporosis.

* 담당자 : 최은미

* Tel : 02-961-0709

* 휴대전화 : 018-246-8023

* Fax : 02-968-0260

* E-mail : cheunmi@hanmail.net