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The effects of a noble botanical agent on early response of osteoblast-like cells

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Background: Periodontitis, a chronic inflammatory disease, destroys connective tissues and alveolar bones. Loss of supporting tissue causes the teeth to become mobile and eventually fall out. The development of host-modulatory agents with low risk of adverse effects has been needed to treat periodontitis. A novel botanical agent (named BT-301), a mixture of extracts from two natural substances, *Panax notoginseng* and *Rehmannia glutinosa libosch*, is developed as a novel botanical agent synthesized with anti-inflammatory effect. Previous study has shown that BT-301 prevents destruction of periodontal tissue by inhibiting the secretion of several cytokines (TNF- α , IL-6) engaged in destruction of periodontal tissue. However, it was reported that *Panax notoginseng* and *Rehmannia glutinosa libosch* have positive effects on osteoblastic cells as well. The aim of this study was to evaluate the cell proliferation effects and the osteogenic effects of BT-301 on osteoblastic cells.

Methods: MC3T3-E1 (ATCC, Rockville, MD, USA) cells were treated with varying concentrations of BT-301 (control, 0.156, 0.312, 0.625, 1.25, 2.5 mg/ml) in α -MEM. And treated cells were incubated for 1 day, 3 days and 5 days. Cell proliferation was assessed by MTT assay. Alkaline phosphatase (ALP) activity of MC3T3-E1 cells treated with varying concentrations of BT-301 (control, 0.156, 0.312, 0.625 mg/ml) were measured spectro-photometrically at day 7.

Results: In MTT assay, optical density increased in all groups with the lapse of time. Optical density increased significantly in 0.312 mg/ml and 0.625 mg/ml concentrations compared to the control group at day 3 and 5 ($p < 0.05$). Post hoc analysis showed significantly high cell activity in order of 0.312 mg/ml, 0.625 mg/ml, 0.156 mg/ml concentration. There was also significant difference of ALP activity in 0.312 mg/ml and 0.625 mg/ml concentrations compared to the control group at day 7 ($p < 0.05$).

Conclusions: 0.312 mg/ml and 0.625 mg/ml of BT-301 showed higher cell proliferation and alkaline phosphatase activity compared to the control group. Proper concentration of BT-301 seems to have positive effects on bone healing.

Biography

Young-gon Sun has completed his DDS at the age of 26 years and MSD at the age of 31 years from Chonnam National University School of Dentistry. He is in the doctoral course on Chonnam National University School of Dentistry. He is a graduate student of Department of Dental Science, Chonnam National University Graduate School and he is supervised by Professor KIM, Young-Joon (Department of Periodontology College of Dentistry Chonnam National University).

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