Effect of Cyanate on the Osteoblast Growth

Dongsan Kidney Institute, Keimyung University, Daegu, Korea

Eun-Ju Chang · Chul-Min Baek · Kyo-Cheol Mun · Hye-Jung Choi
Eun-Ah Hwang · Seung-Yeup Han · Sung-Bae Park · Hyun-Chul Kim

The factors contributing to uremic bone disease are still incompletely characterized. Variety factors appear to have ill-defined roles in this disease. Cyanate, which is derived spontaneously from urea at body temperature and pH, might also play a role in the renal osteodystrophy. We studied the effect of cyanate on the osteoblastic cells. Osteoblastic ROS 17/2.8 cells, exposed to various concentrations of sodium cyanate, were used to analyze for the cytotoxicity. The cyanate-induced cytotoxicity was assessed by the MTT assay. Cells were plated onto 96-well plate at 5,000 cells per well and treated with cyanate for 24 h. At the end of the incubation period, 10 ul MTT was added and then the plates were incubated for 4 h. DMSO was added to solubilize the formazan formed. Then, the absorbance of the reaction solution were recorded at 570 nm. Viability of the treated cells was expressed as A570 of sample/A570 of control. Cyanate treatment produced a dose-dependent cell death. Substantial morphological changes were observed in ROS 17/2.8 cells when they were treated with cyanate. Cells were detached and floated to the top of the culture dish, and a monolayer was not formed with morphologic changes. On the basis of these results, we suggest that cyanate is one of the contributing factors in uremic bone disease.

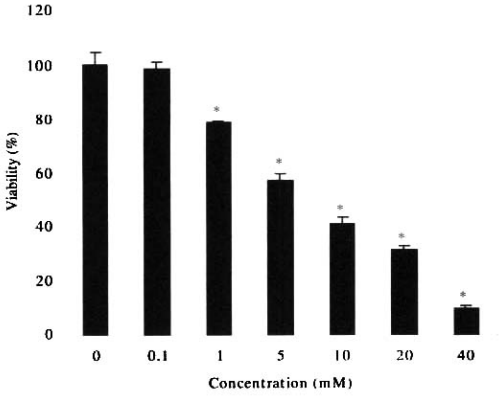

Fig. 1. *Analysis of cell viability cyanate-treated ROS 17/2.8 cells by MTT assay. Cells were plated into 96-well plates and were then treated with different concentrations (0.1, 1, 5, 10, 20, and 40 mM) of cyanate for 24 h. MTT was added to the medium for an additional 4. The viability of cells was detected by measuring the absorbance at a wavelength 570 nm. Each value is presented as the mean SD. *p<0.05 significantly different from the control as analyzed by Student"s t-test.*

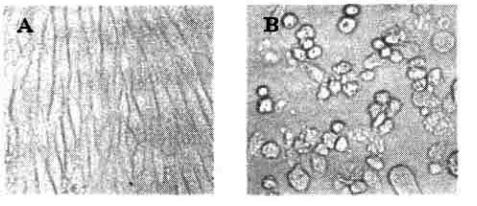

Fig. 2. *Effect of cyanate on morphological changes in ROS 17/2.8 cells. Cells sere incubated in the absence (A) or presence of 20 mM cyanate (B). Cell morphology changes were observed under the light microscope after 24 h.*