

ROLE OF OXIDATIVE STRESS IN LEAD NITRATE INDUCED CYTOTOXIC EFFECTS ON HUMAN LEUKEMIA (HL-60) CELLS

Brandon Barner, Clement G. Yedjou and Paul B. Tchounwou

Natural Chemotherapeutics Research Laboratory, NIH-Center for Environmental Health, College of Science, Engineering and Technology, Jackson State University, 1400 Lynch Street, P.O. Box 18540, Jackson, MS 39217, USA

Abstract: Lead is a heavy metal that is found naturally in the earth crust. Throughout history, lead has been used in various industrial applications including the manufacturing of fossil fuels, paint, plumbing materials, batteries, and cosmetics. Despite its beneficial industrial uses, lead has caused environmental contamination of the air, water, and soil. Recent studies conducted by US Environmental Protection Agency reported that children and pregnant women are the population most vulnerable to the toxic effects of lead exposure. Additionally, a widely cited scientific paper suggests that lead exposure during pregnancy can inversely affect fetal growth, neurological development, and cause spontaneous abortion. The present study was designed to use HL-60 cells as a test model to determine whether lead treatment induced toxicity to human leukemia cells is mediated through oxidative stress. Human leukemia (HL-60) cells were treated with different concentrations of lead nitrate for 24 hr. Live and dead cells was determined by trypan blue exclusion test and microscopic imaging. The role of oxidative stress in lead nitrate toxicity was assessed by lipid peroxidation, glutathione peroxidase (GPx) and catalase (Cat) assays, respectively. Oxidative stress biomarkers showed significant increase ($p < 0.05$) of malondialdehyde levels on one hand and gradual decrease of antioxidant enzyme activity (GPx & Cat) on the other hand with increasing lead nitrate concentrations. Taken together, finding from the present study demonstrates that lead nitrate treatment induced cytotoxic effects through oxidative in HL-60 cells.

Keywords: Lead nitrate, HL-60 cells, trypan blue Test, microscopic imaging

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