Oral Presentation - 09

The Counteractive Effect of Genistein against Lead Toxicity in Rat Bone Marrow-Derived Mesenchymal Stem Cells

Habib Eslami[1,2], Ali Mohammad Sharifi[1], Maryam Rahati[3]

[1]Department of Pharmacology, Razi Institute of Drug Research, Iran University of Medical Sciences, Tehran, Iran

[2]Department of Pharmacology, Research Center of Molecular Medicine, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

[3]Department of Anatomy, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran

Abstract

Objectives: It is a known fact that lead has detrimental effects on bone mass, bone homeostasis and the hemopoietic system. We previously reported that lead acetate could induce cell toxicity and apoptosis in rat bone marrow-derived mesenchymal stem cells (BMMSCs). The aim of this study is to investigate the protective effect of genistein against lead induced apoptosis in MSCs.

Method: Cells were exposed to lead acetate with or without genistein co-administration. Cell viability was measured by 3-(4,5-dimethyl-2-thiazolyl)-2,5-diphenyl tetrazolium MTT assay and changes in protein expression of Bax, Bcl-2 caspases-9, -3, and p53 were evaluated by Western blot analysis.

Results: Our data showed that genistein significantly prevented lead-induced cytotoxicity in a dose-dependent manner, indicated by elevation of cell viability and Bcl-2 /Bax ratio in parallel with a marked diminution in DNA fragmentation and expression of pro-apoptotic proteins, including Bax, caspases-9, -3, and p53.

Conclusions: These results suggest that genistein could reverse the Lead-triggered cell death in MSCs and might be an effective strategy to ameliorate bone marrow toxicity of lead.