The industrial pollution and the bone marrow mesenchymal stem cells: A serious concern for animal life

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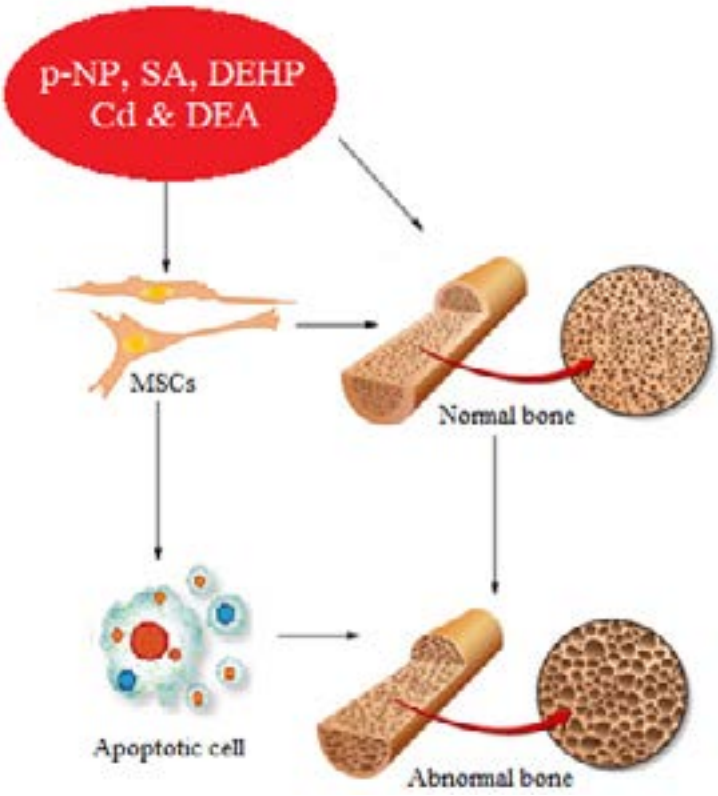
Statement of the Problem: In industrial area a growing number of patients suffering from osteoporosis force us to fuscous on industrial pollution which is released in environment. The pollution enters human and animal body through air, water and food. Bone marrow mesenchymal stem cells (MSCs) are the cellular back up of osteoblasts, the cell responsible for bone matrix production which ensures the wellbeing of this tissue. MSCs are in intimate contact with peripheral blood and through which the industrial pollution are intoxicating the proliferation and differentiation ability of these cells. Proliferation of the MSCs confirms the constant presence, where their differentiation ability provides the animal with strong bone throughout the life. Based on our study the industrial pollution such as sodium arsenite, p-nonylphenol, di-2-ethylhexylphetalate, cadmium, diethaylamine cause the significant reduction of proliferation and differentiation ability of MSCs.

Methodology & Theoretical Orientation: Using various analytical methods such as viability tests, population doubling number, colony forming assay, osteoblast matrix production assay, single cell gel electrophoresis, caspase activation analysis and gene expression study as well as oxidative stress investigation provided us with enormous data regarding the toxic effect of these pollutions on MSCs.

Findings: Our analysis revealed that the viability, proliferation ability and differentiation potential of these cells are wildly affected and the mechanism of these toxicity was also observed to be commonly based on induction of oxidative stress and apoptosis which arrest the cell cycle mainly at G1 stage via over-expression of P53 gene.

Conclusion & Significance: Since the MSCs are playing important role in bone matrix production, their reduction of viability or proliferation bring about bone related complication mainly osteoporosis. As the induction of oxidative stress caused by these chemical can be controlled by natural products of plants, we strongly recommend the increase in daily consumption of plant product.



Biography

Mohammd Hussein Abnosi has opened a new line of research on chemical toxicity regarding the mesenchymal stem cells with respect to osteoporosis and the supplementary medicine using plats natural products such as catechin hydrates, curcumin, silymarin, Gallic acid and so on. He has started the research at 2009 and since then many scientific contributions was made to the scientific world. Throughout these years many students have been graduated under his guidance and started their own professional carries in different region of the world.

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