

**THERAPEUTIC ROLE OF BONE MARROW-DERIVED MESENCHYMAL STEM
CELLS IN LEAD ACETATE-INDUCED NEPHROTOXICITY IN ADULT ALBINO
RAT: HISTOMORPHOMETRIC, BIOCHEMICAL AND IMMUNOHISTOCHEMICAL
STUDY**

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ABSTRACT

Lead is a toxic metal that induces a wide range of structural, biochemical and functional alterations in humans. The present study is designed to explore these changes and to detect their reversibility on cessation of lead exposure. The therapeutic role of bone marrow-derived mesenchymal stem cells (BMSCs) has been also investigated.

Eighty-four adult albino rats, 2-3 month old and weighing 180-200 gm, were utilized. The rats were divided into groups: control, sham control, lead intoxicated, lead intoxicated followed by withdrawal, and lead intoxicated followed by BMSCs. Lead acetate was given by gastric gavage, at a dose of 30 mg/ kg b.wt, three times a week for either two or eight weeks. The BMSCs were injected into the rat tail vein.

In lead intoxication, the current study has demonstrated increase of relative kidney weight, shrinkage of glomeruli and widening of the urinary spaces. The renal tubules showed dilatation, degeneration with cast formation, loss of the apical brush borders and thickening of the basement membranes. In addition, lead has produced an increased amount of the interstitial fibrous tissue of kidney. The serum levels of creatinine, urea and total antioxidants have been also elevated.

The detected changes, induced by lead, are profound in long-term than in short-term intoxication. Most of these changes have been regenerated on injection of BMSCs and to a less extent on withdrawal of lead.