

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

Thesis

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Summary

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 identify this reversibility on cessation of lead exposure. The therapeutic role of bone marrow-derived mesenchymal stem cells (BMSCs) has been also investigated in such intoxication.

Eighty-four adult albino rats, 2-3 month old and weighing 180-200 gm, were utilized in this study. 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 in the form of lead acetate, 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 obtained from the Biochemistry and Molecular Biology Department, Faculty of Medicine, Cairo University and injected into the rat tail vein.

In lead intoxication, the current study has demonstrated enlargement of the kidney, increased relative kidney weight, shrinkage of glomeruli and widening of the urinary spaces. On the tubular level, there were 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.

Most of the hazardous effects of lead have been determined to be statistically significant. 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 this toxic metal.

The present study recommends the establishment of instructional centers, seminars, posters and TV programs that inform the public with the magnitude of this health problem. BMSCs-banks have to be also widely implemented.