

Abstract

Industrial use of nanoparticle and their accumulation during recent decade has created an urgent need to assess their environmental implications. The current study deals with the evaluation of acute toxicity of zinc oxide nanoparticles (Zn-NP) in albino mice. ZnO-NP were prepared by 2-step synthesis method and further characterized by X-ray diffraction (XRD) and Scanning electron microscopy (SEM). Lethal concentrations of Zn-NP were determined; 96-h LC₅₀ value for albino mice was found to be 113.806 mg/kg (body weight). Exposure of albino mice to sub-lethal concentrations of Zn-NP resulted in significantly elevated levels of some vital enzymes of liver and kidney, such as alkaline phosphatase (ALP) and aspartate aminotransferase (AST) whereas, significant increase in the levels of urea, while no significant increase in levels of creatinine were observed. Additionally, altered values of various hematological parameters were observed, such significant increase of white blood cells (WBC) count; and significant decline of hemoglobin (Hb) level; however increase in the number of platelets was found non-significant. Histological studies showed that sub lethal doses of ZnO-NP lead to rupture as well as degeneration of hepatocytes; also, dilations in sinusoids, vacuolization was observed while the central vein was ruptured. Acute of toxicity of ZnO-NP to a biological system, such as albino mice could hence be accomplished.