



ABSTRACT

Industrial use of nanoparticles and their accumulation during the recent decade have created an urgent need to assess their environmental implications. The current study deals with the evaluation of acute toxicity of copper oxide nanoparticles (CuO-NPs) in albino mice (*Mus musculus*). CuO-NPs were prepared via a simple chemical route and characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM). Lethal concentration of CuO-NPs for albino mice injected via intravenous route was found to be 550 mg/kg body weight (BW) and the 96-h LD₅₀ value was calculated to be 422.78 mg/kg BW. Exposure of the albino mice to sub-lethal concentrations of CuO-NPs resulted in altered values of various hematological parameters such as a significant increase in white blood cells (WBCs), and a significant decrease in red blood cells (RBCs), hemoglobin (Hb) level and the number of platelets was observed. Additionally, the treatment with CuO-NPs gave rise to significantly elevated levels of some vital enzymes of liver and kidney, such as alanine aminotransferase (ALT), aspartate aminotransferase (AST), urea and creatinine. Finally, histopathological examination of liver and kidney showed that sub-lethal doses of CuO-NPs, in liver, led to rupture of hepatocytes, dilation of sinusoid space, hemorrhaging in hepatic tissues, and congestion of the central vein with red blood cells leading towards ultimate rupture. On the other hand, the kidney showed ruptured renal capsule, loss of urinary space, swelling in glomerulus, degeneration in podocysts, and cytoplasmic vacuolization.