عنوان مقاله:

Route of administration induced in vivo effects and toxicity responses of Zinc Oxide nanorods at molecular and genetic levels

محل انتشار:

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خلاصه مقاله:

Zinc oxide (ZnO) nanoparticles have received growing attention for several biomedical applications. Nanoparticles proposed for these applications possess the potential to interact with biological components such as the blood, cells/ tissues following their administration into the body. Hence we carried out in vivo investigations in Swiss Albino Mice to understand the interaction of ZnO nanorods with the biological components following intravenous and oral routes of administration to assess nanoparticles safety. Intravenously injected ZnO nanorods were found to induce the significant reduction in the red blood cells and platelet counts. Elevated levels of serum enzymes such as serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase were observed following intravenous and oral administration. Also, increased levels ($p < ۰.۰۵$) of oxidative stress markers such as glutathione in the liver of intravenous treated mice and liver, spleen of oral treated mice; and lipid peroxidation in the spleen of intravenous treated mice compared to untreated mice. Significant DNA damage was observed in liver, spleen, and kidney of mice treated intravenously; liver and kidney of mice treated orally compared to untreated mice. Histology revealed focal venous congestion in the liver of intravenous and oral treated mice; more red pulp congestion in the spleen of oral treated mice compared to the intravenous treated group; pulmonary vascular congestion in intravenous (mild) and oral

treated mice (moderate). In conclusion differences in the histology of the organs tested could be due to the differences in the distributed concentrations of nanoparticles. These findings can be considered helpful for the development of .biocompatible nanoparticles for biomedical applications

کلمات کلیدی:

Genotoxicity, Hemocompatibility, histopathology, Oxidative stress, Zinc oxide nanoparticles