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Zinc oxide nanoparticules induced histological, histochemical and genotoxicity effects in kidney of adult male rabbits

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Our aim was to study the histological, histochemical and genotoxic effects of ZnO NPs on the kidney of adult male rabbits. Fifteen adult male rabbits were divided equally into three groups. Group I was the control group; group II was the low dose treated group, in which rabbits were intraperitoneal injected with ZnO NPs (100 mg/kg/day) for 14 days; and in group III was the high dose treated group, rabbits were injected intra peritoneally with ZnO NPs (250 mg/kg/day) for 14 day. At the end of the experiment, specimens from the kidney were taken and stained by H&E, PAS and Masson trichome stains. Also bone marrows were isolated for flow cytometry to study genotoxicity. ZnO NPs was nephrotoxic and led to prominent histopathological changes in the kidney. There were destructions of the renal tubules, in form of loss of brush border, vacuolation of cytoplasm and intratubular protein depositions. Also there was interstitial infiltration of inflammatory cells. The renal corpuscles were dilated and congested. There was increase in apoptotic cell rate of bone marrow samples and showed greater and distinct fragmentation or shearing DNA. ZnO NPs had cytotoxic and genotoxic effects in the kidney. It increased apoptotic rate of the bone marrow cells and fragmentation of DNA. ROS may be the main cause of cytotoxic effects. ZnO NPs was toxic in dose dependent manner.

Keywords: apoptosis, cell cycle, DNA fragmentation, Histology, Histochemistry, genotoxicity, Zinc oxide.

Biography

Tito N. Habib is currently is the head of molecular genetics' Lab., Zoology department, Faculty of Science, Sohag University, since 2015 till 2018, and a professor of Genetics & molecular Biology. He got his PhD from Texas A& M University, in 1999 as a visiting scholar in the department of Wildlife and Fisheries Science, Bryan-College Station, Texas, USA, in the field of Molecular Genetics. He followed his promotion as assistant professor of molecular Genetics, Zoology department, Faculty of Science, Sohag University, Egypt, (2007-2011), and Head of Biology Department, Faculty of Science, Balgurashi, Albaha University, KSA (2011-2015). He served as HEEPF project council member (B-035-P1) for the development of Genetics' courses, Faculty of Science, Sohag University, Egypt. He was a main advisor for 2 PhD, and 2 Master Thesis in Medical Genetics topics, Faculty of Medicine, Sohag University. He served as a Head of the Egyptian Syndicate of Scientific professions (Sohag-branch) from December, 2017 till February, 2020. He works as a reviewer for journal of Clinical Pathology and Forensic Medicine, Chronicle Journal of Cancer Science. He got an invitation from 7th International Conference on Biomedical Engineering and Biotechnology (ICBEB 2018) which will be hold in October 17th - 20th, 2018, Nanjing, China.

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