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Cerium Oxide Nanoparticles in Pursuit of Protection against Doxorubicin-Induced Liver Insult in Rats

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Doxorubicin (DOX) is considered as a backbone in several chemotherapeutic regimens. Nevertheless, the reported systemic toxicity usually hampers its broad application. Interestingly, Cerium oxide nanoparticles (CeONPs) depicted promising regenerative antioxidant and hepatoprotective potentials against multiple oxidative stress-induced pathologies. Thus, the aim of the present study was to determine either CeONPs would display hepatoprotective properties once concomitantly administered with DOX or not. Male Sprague Dawley rats were divided into four groups (n=10) in a two weeks study: Control (received saline, IP injection thrice a week), CeO (0.5mg/kg, IP injection once a week), DOX (2.5mg/kg, IP injections thrice a week) and DOX+CeO (received both treatments). Hepatic toxicity was assessed by histological and ultrastructural studies. In addition, serum transaminases (ALT, AST) and malondialdehyde (MDA), as an oxidative stress marker, were evaluated. CeONPs were not only proved to be safe at the proposed dose but also their concomitant administration with DOX managed to mitigate DOX-induced hepatic insult on both histological and biochemical aspects. Such hepatoprotective behavior was referred to the noticed antioxidant action CeONPs as highlighted by the significant difference in MDA levels.

Biography:

Heba G. Ibrahim has completed his B.Sc from University of Alexandria in 2013. Her area of research is characterization and applications of nanoparticles. She has submitted her M.Sc. thesis entitled histological study of the potential prophylactic role of cerium oxide nanoparticles against doxorubicin-induced hepatotoxicity in rats.