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Biocompatible amifostine nanoemulsion via expression of nephrin in

nephrotoxic experimental rat

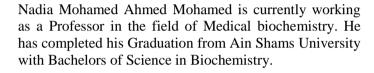
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Abstract

Drug-induced kidney injury is the causative of acute kidney failure. Amifostine loaded silica nanoemulsion was synthesized using water/oil emulsion with the help of ultra-sonication waves. The nanoemulsion was prepared Tetraethvl Orthosilicate Cetyltrimethylammonium Bromide [CTAB], Castor Oil [CAO] and Amifostine [AMF] as a source for silica, surfactant, extra stabilizing agent and a model drug respectively. The as synthesized nanoemulsion of silica and silica loaded with amifostine [SiNPs@AMF] was examined via Transmission Electron Microscopy [TEM] and Dynamic Light Scattering [DLS] in terms of particles shape and hydrodynamic average size. The study was extended to investigate the protective role of this nanoemulsion model as cytoprotective drug effect against cisplatin-induced nephrotoxicity in male albino rats. It was clearly seen that the successful preparation of the assynthesized silica nanoemulsion loaded with amifostine [SiNPs@AMF] but the particle size was marginally increased when comparing with silica nanoemulsion. Additionally, Blood Urea Nitrogen (BUN), Serum Creatinine (SC) and Urinary Total Protein (UTP) were increased and the level of Creatinine Clearance (Crcl) was decreased. All those were met with disorders in oxidative stress and down regulation in expression of nephrin gene. Also, histopathologic changes of the kidney tissue were observed. These changes back to normal by treatment nanoparticles with silica loaded amifostine [SiNPs@AMF]. Oil/water nanoemulsion [SiNPs@AMF] showed a protective and promising preventive strategy against nephrotoxicity due to their cytoprotective and antioxidant effects.



Biography:



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