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Antifibrotic effects of gallic acid on activation/proliferation of cultured hepatic stellate cells and in thioacetamide-induced liver fibrogenesis in rats

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Hepatic stellate cells (HSCs), activated during liver injury, constitute a prime target for antifibrotic therapy. The presence of phenolic compounds in fruit- and vegetable-rich diets has attracted researchers' attention due to their health-promoting effects. This study investigates the antifibrotic effect of gallic acid (GA) of Punica granatum L. on experimental liver fibrosis in vitro and in vivo and its possible mechanism. The anti-proliferative activity of GA on cultured HT-6 HSCs was determined by cell viability using sulforhodamine base (SRB) cytotoxicity assay. Preliminary data showed that cell viability of HSCs was significantly decreased when treated with 5, 12.5, 25, 50, 100, 150, 200, 400 and 500 µg/ml of GA for 24 and 48 hours, in a concentration and time-dependent manner, with IC50 equals 42 and 18 µg/ml respectively. Oral administration of GA in a dose of 50 mg/kg daily for 8 weeks successfully alleviated the thioacetamide (TAA)-induced rat liver damage, decreased collagen accumulation, serum ALT and AST activities, liver tissue TIMP-1, TGF-β1 and PDGF-BB levels, and liver fibrosis grade (from S4 to S2 with mild, thin fibrous bands). Additionally, immunohistochemistry of liver fibrosis related markers such as α-SMA and PCNA were reduced, and the activity of GSH as well as the MDA content was reversed in treated rats. These results suggested that GA decreased HSCs viability and could act against TAA-induced liver injury and fibrosis in rats by a mechanism related to its antioxidant properties, anti-inflammatory effect and its ability to attenuate HSCs activation and proliferation.

Biography

Naglaa M El-Lakkany has completed her PhD from Ain Shams University, Faculty of Science. She is the Head of Pharmacology Department, TBRI. She shared in establishment of "Drug Evaluation and Discovery Unit" and is one of the Senior Staff of the "ANDI Centre of Excellence on anti-trematodal R&D". She has published 25 articles in peer review journals. She awarded the TBRI best research articles 2011, 2012 and the TBRI Excellence award 2014. She was included in Marquis Who's Who in Medicine and Health care, 2009-2010, in the International Health Professional of The Year 2010 and Selected for the institute's WOMAN OF THE YEAR 2011. She awarded in 2015 an appreciation certificate as a recognized reviewer in all Elsevier Journals.

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