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Thymoquinone attenuates cisplatin induced toxicity and oxidative damage in rat kidney

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N ephrotoxicity is a severe complication in patients undergoing cisplatin (CP) chemotherapy. Thymoquinone (TQ), a monoterpene isolated from volatile oil of *Nigella sativa* seeds has been shown to exhibit strong antioxidant properties and protective effects against oxidative damage induced by several drugs and toxicants. The present study was undertaken to investigate whether TQ can prevent the CP-induced nephrotoxic effects or not. Rats were divided into four groups: Control, CP, TQ and CP+TQ. Rats in the groups CP+TQ and TQ were administered TQ (1.5 mg/kg bwt orally), prior to and simultaneously with and without, multiple doses of CP (3 mg/kg bwt, i.p) every fourth day for 20 days, respectively. CP nephrotoxicity was evident by increased serum creatinine (Scr) and blood urea nitrogen (BUN). CP treatment caused oxidant/antioxidant imbalances as reflected by increased lipid peroxidation (LPO), decreased enzymatic and non-enzymatic antioxidants. Furthermore, the activities of brush border membrane (BBM) marker enzymes like alkaline phosphatase (ALP), γ -glutamyl transferase (GGTase) and leucine aminopeptidase (LAP) were significantly declined in renal cortical and medullary homogenates and in isolated BBM vesicles (BBMV) in CP treated rats. Oral TQ administration, significantly attenuated CP induced increase in Scr and BUN and decrease in BBM enzymes activities. TQ administration also precluded CP induced alterations in the enzymatic and non-enzymatic antioxidant parameters. Histopathological observations showed extensive kidney damage in CP treated animals and remarkably reduced renal injury in CP and TQ co-treated group. The results suggested that TQ alleviates CP induced nephrotoxicity and oxidative damage by strengthening antioxidant defense mechanism in the kidney.

Biography

Zeba Farooqui is currently pursuing PhD at the Department of Biochemistry, Aligarh Muslim University (AMU), India. She is currently working on "protective effect of *Nigella sativa* and thymoquinone on cisplatin induced toxicity in rat kidney". She has published a research article in an international journal. She has presented her work in several scientific meetings and conferences.

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