Examination of the antioxidant properties of a novel lipophilic fluoroquinolone compounds in a rat model of oxidative stress

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Abstract

Oxidative stress is initiated in bodies due to enormous endogenous and exogenous factors, and is characterized by production of free radicals in higher amounts than our antioxidants scavenging capacity mainly used to restore the internal balance,which may cause damage to many organs especially the main site of detoxification the liver. In this study, for the first time five novel lipophilic fluoroquinolone compounds were used to test their antioxidant activities by using paracetamol (APAP) and CCl4 models to induce hepatotoxicity as *in-vivo* rat model by using 64 male Wistar rats weighing 200 ± 10 g divided into 7 groups per model and two groups as a control for each model and 4 rats per group. Antioxidant enzymes (CAT, TAS, GSH, SOD and GPx) were measured by using an ELISA kit assys, in addition to measuring liver enzymes ALT and AST. Results showed a decrease in ALT and AST levels after administrating the fluoroquinolone compounds in both CCl4 and APAP models on the other hand increasing in all antioxidant

enzymes after administration of fluoroquinolone compounds in both models. In conclusion, the 5 fluoroquinolone compounds exhibit promising antioxidant activity that might be due to their structure feature requirements including beta keto-COOH group, ethylene diamine bridges, lipophilic properties and substituted with halogen atoms. This research has highlighted the importance of iron-chelating diamine groups usage as an antioxidants validated in two different models for the first time.

Keywords: Antioxidant, Lipophilic Fluoroquinolones, Free Radical, Oxidative Stress