

Protective Role of CoQ10 or L-Carnitine on the Integrity of the Myocardium in Doxorubicin Induced Toxicity

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Abstract : Doxorubicin (DOX) is a chemotherapeutic agent used for the treatment of different cancers and its clinical usage is hindered by the oxidative injury-related cardiotoxicity. This work aims to declare if the harmful effects of DOX on the heart can be alleviated with the use of Coenzyme Q10 (CoQ10) or L-carnitine. The study was performed on seventy-two female Wistar albino rats divided into six groups, 12 animals each: Control group; DOX group (10 mg/kg); CoQ10 group (200 mg/kg); L-carnitine group (100 mg/kg); DOX + CoQ10 group; DOX + L-carnitine group. CoQ10 and L-carnitine treatment orally started five days before a single dose of 10 mg/kg DOX that injected intraperitoneally (IP) then the treatment continued for ten days. At the end of the study, serum biochemical parameters of cardiac damage, oxidative stress indices, and histopathological changes were investigated. CoQ10 or L-carnitine showed noticeable effects in improving cardiac functions evidenced reducing serum enzymes as serum interleukin-1 beta (IL-1), tumor necrosis factor alpha (TNF-), leptin, lactate dehydrogenase (LDH), Cardiotrophin-1, Troponin-I and Troponin-T. Also, alleviate oxidative stress, decrease of cardiac Malondialdehyde (MDA), Nitric oxide (NO) and restoring cardiac reduced glutathione levels to normal levels. Both corrected the cardiac alterations histologically and ultrastructurally. With visible improvements in -SMA, vimentin and eNOS immunohistochemical markers. CoQ10 or L-carnitine supplementation improves the functional and structural integrity of the myocardium.

Keywords : CoQ10, doxorubicin, L-Carnitine, cardiotoxicity

Conference Title : ICBBMB 2018 : International Conference on Biochemistry, Biophysics and Molecular Biology

Conference Location : Dublin, Ireland

Conference Dates : July 23-24, 2018