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Protective effect of Baicalein alone and co-administered with Losartan on Doxorubicin-induced Nephrotoxicity in rats

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Doxorubicin (DOX) is a widely used antineoplastic drug with several toxic effects. We investigated the protective effect of co-administration of Baicalein (BL; a flavonoid) and losartan (LT; angiotensin receptor blocker) on DOX-induced nephrotoxicity. Male Wistar albino rats were divided into these seven groups (n=6): 1) Control group; 2) DOX group; 3) DOX+BL group (BL, 10 mg/kg/day); 4) DOX+LT group (LT, 7 mg/kg/day) and 5) DOX+LT+BL(10) group. After two weeks of LT and BL treatment, a dose of DOX was administered. Serum renal markers such as creatinine and urea levels were significant (P <0.001) elevated in DOX challenged group compared to normal animals. Renal pro-inflammatory cytokines including tumour necrosis factor-α (TNFα), interleukin (IL-1β and IL-6) levels were significantly (P<0.001) increased while an anti-inflammatory cytokine IL-10 levels were markedly (P<0.001) increased in DOX challenged group compared to controls. Oxidative stress biomarkers including thiobarbituric acid reaction substances (TBARS) and glutathione (GSH) in renal cells were significantly (P<0.001) increased and decreased compared to control group respectively. Enzymatic activities of superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and glutathione-S-transferase (GST) in renal cells were significantly (P<0.01) decreased in DOX challenged rats compared to normal. In addition, renal protein expressions and inflammatory activities of caspase-3, n-nitric oxide syntheses (nNOS), inducible nitric oxide synthase (iNOS), endothelial nitric oxide synthase(eNOS) and nuclear factor kappa-B (NF-κB) p65 were significantly (P<0.001) increased in DOX challenged rats when compared to control animals. While the DOX-induced increase in serum renal markers, pro-inflammatory cytokines and biomarkers was alleviated by BL and/or LT treatment and showed the most potent protective effects. Our study demonstrates remarkable anti-oxidative and anti-inflammatory effects of BL and LT in rodents challenged with DOX.

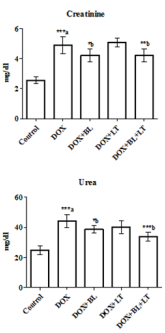

Figure 1: Effect of baicalein (BL) or/and losartan (LT) on doxorubicin (DOX)-induced changes in serum levels of creatinine and urea Data were expressed as Mean±S.D., (n=6) and analyzed using one-way ANOVA followed by Student Newman-Keuls as post hoc test. [a] Control vs DOX group; [b] DOX vs DOX+BL or DOX vs DOX+LT or DOX vs DOX+BL+LT. P values consider significant when *P<0.05, **P<0.01 and ***P<0.001.

Biography

Ziad H Al-Oanzi has graduated from Institute of Cellular Medicine, The Medical Science University of Newcastle (UK), has PhD was focusing on The role of the hexosamine biosynthesis pathway in control of hepatic glucose metabolism. His current research interests are biochemistry of liver, glucose and glycogen metabolism, metabolism control in gene expression, inflammation and antioxidants. He is working as an assistant professor at the Jouf University, College of Applied Medical Science, Sakaka, Saudi Arabia.

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