

Protective effects of crocin on cardiotoxicity induced by subchronic administration of diazinon in rats

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Background and Aims: This study was designed to evaluate the effectiveness of crocin, main component of *Crocus sativus* L. (Saffron) against diazinon (DZN) induced cardiotoxicity in subchronic exposure in rats.

Methods: Rats were equally divided into 7 groups; Control (Corn oil), DZN (15mg/kg), crocin (each group received 12.5, 25 or 50 mg/kg crocin plus DZN), vitamin E (200 IU/kg plus DZN) and crocin (50 mg/kg) treated groups. DZN was treated through gavage once a day for 4 weeks. Vit. E and crocin were intraperitoneally injected to rats for 4 weeks three times per week and once a day, respectively.

Results: DZN indicated cardiac toxicity as evidenced by inducing histopathological damages as well as elevated cardiac marker creatine phosphokinase MB (CK-MB). These effects were associated with increased production of oxidative stress (malondialdehyde level) and apoptosis by induction of the expression of BAX/Bcl2 ratio (both protein and mRNA level), increase in cytochrome C release to the cytosol and activated caspase 3 in cardiac tissues. These changes were restored by co treatment with crocin (25 and 50 mg/kg) or Vit.E which resulted in significant improvement in the histopathological damages induced by DZN. Furthermore, co treatment with crocin (25 and 50 mg/kg) or Vit.E significantly decreased malondialdehyde (MDA) level as well as CK-MB in the heart tissue and attenuated the increased of BAX/Bcl2 ratio (both protein and mRNA level), activation of caspase 3 and release of cytochrome C to the cytosol induced by DZN in the rat heart tissue.

Conclusions: Our results showed that mitochondrial dependent apoptosis pathway was involved in DZN cardiotoxicity. Also, crocin, as an antioxidant, has protective effect against DZN cardiotoxicity by antiperoxidative and antiapoptotic activities.

Keywords: Diazinon; Crocin; Oxidative stress; Apoptosis