Modulatory effect of Diosmin, a natural flavanone in the prevention of Benzo(a)Pyrene induced lung toxicity

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Benzo(a)pyrene [B(a)P], a polycyclic aromatic hydrocarbon (PAH) as well as a strong toxicant is widely present in the environment. Various naturally occurring flavanones have been used for prevention of B(a)P induced lung toxicity. Diosmin, a flavonone was given orally to Swiss Albino Mice (SAM) for a duration of 2 weeks (14 days) and a single dose of B(a)P (125 mg/kg body weight) was given at the end of the second week (on 14th day). The mice were sacrificed one day after the final dose. Administration of B(a)P increased the activities of toxicity markers such as Lactate dehydrogenase (LDH), Lipid peroxidation (LPO) and Xanthine oxidase (XO) with a subsequent decrease in the activities of tissue anti-oxidant machinery (GR, GST, GPx and GSH). B(a)P treatment also causes upregulation of inflammatory markers IL- 6, NF-kB, COX-2 among others. However, pre-treatment with Diosmin at doses of 100 and 200 mg/kg body weight significantly decreases LDH, LPO, XO while increasing the anti-oxidant machinery and also regulating the anti-inflammatory markers. Upregulation of Bax as well as caspase 3 which was caused due to the administration of B(a)P, was significantly found to be decreased in the group treated with Diosmin as compared to the toxicant group alone. Histopathological results further confirmed the protective role of Diosmin against B(a)P-induced lung toxicity. These findings suggest that Diosmin supplementation is beneficial in maintaining the integrity of alveoli and the epithelium which may be used as a protective agent in B[a]P induced oxidative stress and lung damage.

Keywords: Benzo(a)pyrene, Diosmin, flavanone, lung toxicity

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I have completed my Master of Science (Biochemistry) from Jamia Millia Islamia, New Delhi (INDIA) and currently pursuing Ph.D. (Toxicology) from Jamia Hamdard, New Delhi. I have 3 publications to my name.

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