Oral Abstracts

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CHOLINESTERASE ENZYME REACTIVATION AND BRAIN MITOCHONDRIA PROTECTION BY QUERCETIN AND RUTIN IN ACUTE POISONING BY DIAZINON IN MICE

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Objectives: Acute poisoning by Organophosphate (OP) pesticides is an essential clinical problem in rural Asia. Medical management is so complicated and use of atropine, oxygen and fluids is required to deliver of oxygen to the tissues. Oximes, principally pralidoxime (2-PAM), have been used as antidotes but The role of oximes is not totally obvious and they might be benefit in moderate poisoning or specific pesticides. Also produce of stable phosphoryl oximes (POXs) with high anticholinesterase activity and greater anti- serine esterases potencies than the OP inhibitors from which they were derived, causes difficult management of poisoning. Plasma high concentration of OP is one important medical problem for treatment of OP because the released inhibited cholinestrase by oximes may be re-inhibited again. Quercetin (QR) and Rutin (RT) are the nucleophile compounds with no toxicity effects. In the present study, feasibility of quercetin and Rutin administration as therapeutic agents for OP poisoning was studied and compared with 2-PAM administration in mice.

Methods: QR and RT at doses of (50, 100, 200 mg/kg) were administered intraperitoneal (ip) 15 minutes after a single intraperitoneal injection of Diazinon (DZ) (LD50=366 mg/kg). Atropine (AT; 20 mg/kg, ip) and pralidoxime (2-PAM; 30 mg/kg, ip) were used alone or together as standard therapy or controls in different (12) groups. acetylcholinesterase (AChE) and buthyrylcholinesterase (BChE) were measured after three and 24 h as markers of OP toxicity. Mitochondrial function, Lipid peroxidation (LPO), Protein carbonyl (PC) and Glutathione (GLU) content were evaluated in the mice brain mitochondria.

Results: Significant increase of AChE and BChE activity were observed by the QR and RT at all doses as compared with DZ group. QR at dose of 100 mg/kg and RT at dose of 200 mg/kg significantly increased the AChEactiivity and QR and RT at dose of 200 mg/kg significantly increased the BChE enzyme activity in comparison to DZ+PAM and DZ+AT after three hours. QR at doses of 100, 200 mg/kg and RT at dose of 200 mg/kg significantly increased the AChE and BChE enzyme activity in comparison to DZ+PAM, DZ+AT and DZ+PAM+AT after 24 hours. Brain mitochondria function were increased significantly by QR and RT at all doses as compared with DZ group. LPO and PC content were significantly decreased after administration of QR and RT when compared with DZ group but not with DZ+PAM group. A significant increase of GLU content was observed in the RT (100mg/kg) group when compared with DZ and DZ+PAM groups.

Conclusion: It is concluded that QR and RT are more effective than 2-PAM to reactivation and also prevention of re-inhibition of the reactivated enzyme after 3 and 24 h. High nucleophilic properties of QR and RT can be considered as the mechanism proposed for ChE reactivation. Mitochondria protective effect of the QR and RT may be due to increase of bioactive compounds, plasma antioxidants or direct scavenging of free radicals.