Effects of Acute Exposure to Rabbits of Diphenyl Diselenide: A Toxicological Study

Straliotto, M.R.[1], Mancini, G.[1]; Oliveira, J.[1] ,Glaser, V.[1], Dafre, A.[2], Santos, A. A.[1], Santos, V.V.[1], Matos, F.J.[1], Latini, A.[1], Rocha, J.B.T.[3],Bem, A.F.[1]

[1]Departamento de Bioquímica, [2]Departamento de Fisiologia Centro de Ciências Biológicas, Universidade Federal de Santa Catarina, Florianópolis, SC
[3]Departamento de Química, Centro de Ciências Naturais e Exatas, Universidade Federal de Santa Maria, Santa Maria – RS

Selenium compounds, like diphenyl diselenide $(PhSe)_2$, possess glutathione peroxidase (GSHPx)-like activities and other antioxidant properties. The aim of this study was to evaluate the effects of acute administration of $(PhSe)_2$ on various toxicological parameters in the brain structures, liver, heart, muscle, kidney and blood of rabbits. Adult New Zealand rabbits (female and male) were exposed to diphenyl diselenide (5-500 $\mu mol.kg^{-1}$, intraperitoneally) once a day for 5 days. Biochemical parameters were analyzed using spectrophotometry. The exposure to 500 $\mu mol.kg^{-1}$ caused 85% of mortality and the lethal dose was 311 $\mu mol.kg^{-1}$. It was found that 50 $\mu mol.kg^{-1}$ of $(PhSe)_2$ increased the non-protein thiol (NPSH) levels in the hippocampus, kidney, heart, muscle and blood while the lipoperoxidation was decreased in cerebellum and kidney with the exposure to 5 $\mu mol.kg^{-1}$. The activity of glutathione peroxidase (GPx) increased in heart and muscle of the rabbits treated with 50 $\mu mol.kg^{-1}$ of $(PhSe)_2$, whereas the activity of glutathione reductase (GR) was reduced in cerebellum, cerebral cortex and kidney. Treatment with $(PhSe)_2$ reduced the activity of d-ALA-D in the hippocampus and increased this activity in heart. The hepatic and renal biochemical parameters were not modified by $(PhSe)_2$. These results indicated that acute exposure of $(PhSe)_2$ is safe to rabbits up to 50 $\mu mol.kg^{-1}$, that encourage further experiments on the therapeutic properties of this compound.

Keywords: diphenyl diselenide, toxicity, oxidative stress.

Financial support: FAPESC