The effect of zinc and/or vitamin E supplementation on biochemical parameters of selenium-overdosed rats


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Abstract

The normotensive (Wistar) and spontaneously hypertensive (SHR) rats were examined to assess the response of the organism to selenium (Se) overdose. Moreover, the effect of zinc (Zn) and vitamin E, i.e. dietary components interacting in many biochemical processes with Se, on the Se uptake was evaluated. The control group was fed an untreated diet, and the diets of two other groups were overdosed with Se in the form of sodium selenite (9 mg/kg) and supplemented with Zn (13 mg/kg). Two experimental groups were fed a diet supplemented with Zn (13 mg/kg) and Se at an adequate level (0.009 mg/kg); a half of the animals was supplemented with vitamin E. The results showed significant differences in the Se contents between the rat strains in case of Se-overdosed groups, where in the liver and kidney tissue Se contents of SHR rats exceeded 3- and 7-fold the normotensive ones. The Se uptake was altered by the vitamin E; no effect of Zn was observed. Activities of antioxidant enzymes were determined in the animal tissues indicating different patterns according to rat strain, tissue analysed, and administered Se dose. Thus, Se overdose, for instance, via an incorrectly prepared dietary supplement, can result in serious imbalances of the biochemical status of the animals.

Key words: selenium, zinc, vitamin E, Rattus norvegicus, biochemical parameters