Concentration of hepatic vitamins A and E in rats exposed to chlorpyrifos and/or enrofloxacin

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Abstract

The aim of the study was to determine the level of antioxidant vitamins A and E in the liver of rats exposed to chlorpyrifos and/or enrofloxacin. Chlorpyrifos (Group I) was administered at a dose of 0.04 LD₅₀ (6 mg/kg b.w.) for 28 days, and enrofloxacin (Group II) at a dose of 5 mg/kg b.w. for 5 consecutive days. The animals of group III were given both of the mentioned above compounds at the same manner as groups I and II, but enrofloxacin was applied to rats for the last 5 days of chlorpyrifos exposure (i.e. on day 24, 25, 26, 27 and 28). Chlorpyrifos and enrofloxacin were administered to rats intragastrically via a gastric tube. The quantitative determination of vitamins was made by the HPLC method. The results of this study indicated a reduction in the hepatic concentrations of vitamins A and E, compared to the control, which sustained for the entire period of the experiment. The four-week administration of chlorpyrifos to rats resulted in a significant decrease of vitamins in the initial period of the experiment, i.e. up to 24 hours after exposure. For vitamin A the maximum drop was observed after 24 hours (19.24%) and for vitamin E after 6 hours (23.19%). Enrofloxacin caused a slight (3-9%) reduction in the level of the analysed vitamins. In the chlorpyrifos-enrofloxacin co-exposure group reduced vitamins A and E levels were also noted, but changes in this group were less pronounced in comparison to the animals intoxicated with chlorpyrifos only. The decrease in the antioxidant vitamin levels, particularly noticeable in the chlorpyrifos- and the chlorpyrifos combined with enrofloxacin-treated groups, may result not only from the increase in the concentration of free radicals, but also from the intensification of the secondary stages of lipid peroxidation.

Key words: chlorpyrifos, enrofloxacin, vitamin A, vitamin E, rats

Introduction

Environmental pollution plays a crucial role in the occurrence of health problems affecting animals and human beings. Investigations which have been conducted in recent years indicate the need for studies estimating the potential harmful effects of substances of high biological activity, such as pesticides and medicines. A great deal of emphasis has been placed on evaluating the potential harmfulness of co-intoxication with these compounds (Liu et al. 2006, Wielgomas and Krechniak 2007).

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