Impact of Di(2-ethylhexyl) phthalate administration on various trace elements in rat serum

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Di(2-ethylhexyl) phthalate (DEHP), is used in the production of polyvinyl chloride and belongs to phthalatic-acid esters which is a widely-used plasticizer for synthetic polymers. DEHP may have effects such as potential endocrine disruptive, reproductive toxicity, inducing carcinogenesis that lead to fetal death and malformations in the laboratory animals. The aim of this study was to investigate the effects of DEHP administration on trace elements concentrations in serums samples of rats fed with various concentrations of DEHP.

6 weeks old, 24 pubertal male Wistar albino rats (200-220g) were used. All treatments were administered daily by oral gavage and indicated procedure took four weeks. The dosing solution was prepared by mixing the compound with corn oil and diluting in series with corn oil to the desired concentration of 100, 200 and 400 mg/kg DEHP. The male rats were divided into four groups. In the negative control group, the animals were only given corn oil oral gavage. Other groups were dosed with 100, 200 and 400 mg/kg/day of DEHP. At the end of 28th day, we take blood samples were taken from heart after fasting 12 h. Serum was separated and frozen until analysis. Serum samples were diluted to 1:600 with 65% nitric acid (Merc Millipore) for (ICP-MS) determination. Trace elements concentration in the serum samples were measured with Agilent 7700x ICP-MS (Agilent Technologies Inc., Tokyo, Japan) equipped with octupole reaction system with Helium collision cell for spectral interference removal.

Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, K, Li, Mg, Mn, Na, Ni, Pb, Rb, Se, Sr, Ti, U, V, Zn were investigated in the serum samples of rat fed with DEHP. Our data have indicated that concentration levels of Na, Ca, Rb, K and Cs significantly decreased in serum samples of rats feed with increased concentrations (100, 200, 400 mg/kg/day) of DEHP. Fe and Se concentrations in the indicated serum samples have significantly increased in each concentrations.