THE EFFECT OF ESTRADIOL ON THE OXIDATIVE DAMAGE AND TRACE ELEMENT LEVEL DETERMINED IN THE LIVER OF RATS TREATED WITH DIMETHYLARLSINIC ACID

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SUMMARY

DMA – dimethylarsinic acid (cacodylic acid) – used as an herbicide, is the major metabolite formed after the exposure to inorganic arsenics in mammals. It is considered to have an important role in arsenic carcinogenesis through the induction of oxidative damage in various tissues. Estradiol, apart from its main hormonal effect, displays both prooxidative and antioxidative action depending on the condition of the treatment. The oxidative stress plays a crucial role in estrogen-induced carcinogenesis. In the experiments performed in female Wistar rats receiving drinking water ad libitum with 0.01% DMA for 10 weeks, one half of rats was treated with 17β-estradiol (0.1 mg/rat s.c., twice a week) starting the 3rd week. One more group received estradiol only and last group served as controls receiving drinking water without treatment. The DMA enhanced lipid peroxidation in the liver; estradiol treatment potentiated this effect of arsenic. The GSH level was enhanced in DMA+estradiol treated group. In estradiol-only treated group both the lipid peroxidation and GSH content were increased. The administration of estradiol caused an enhancement of several trace element concentrations in the liver, mainly that of iron and copper. The critical role of estrogen on the development of oxidative stress was thus proved.

Key words: dimethylarsinic acid, DMA, estrogens, estradiol, oxidative damage, trace elements

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