

EFFECT OF SUBCHRONIC DIBUTYL PHTHALATE EXPOSURE ON THE LEVELS OF REPRODUCTIVE HORMONES IN FEMALE WISTAR RATS

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Abstract

Dibutyl phthalate (DBP), widely used as a plasticizer in different items including medical equipment, elastic plastics, cosmetic formulations and toys becomes the predominant contaminant in the environment. Phthalates are known endocrine-disrupting chemicals that can directly target the ovary, potentially causing defects in ovulation and fertility.

The aim of our study was to determine whether DBP treatment affects sex hormones levels in female rat.

Twenty-four female Wistar rats, 40 days old at the beginning of the experiment, were divided into 4 groups (6 per group) and exposed subchronically (3 months) to DBP added to the diet in concentrations: 0, 100, 500, 5000 mg DBP/kg diet, that correspond to 6.69, 33.73 and 344.49 mg/kg BW/day. At necropsy plasma was collected in vacutainer tube for clinical biochemical tests. Biochemical analysis are performed in the Biochemical laboratory. Statistical analysis was performed using STATISTICA® version 13.0 (StatSoft, Inc). Data from control and treated rats were compared using One-way analysis of variance (ANOVA) for multiple comparisons, followed by Tukey post-hoc tests.

Statistical analysis revealed that treatment in doses of 100 and 500 mg DBP/kg diet significantly decreased estrogen levels, while in the group exposed to 5000 mg DBP/kg diet no differences in estrogen level was detected when compared with control. Results also showed a significant decrease in progesterone levels in all treated groups compared to the control group.

Taken together, our results indicated that subchronically exposure to DBP induced reduction of progesterone levels, while decreased estrogen level depends of dose. Phthalates exposure could possibly be an important environmental etiological factor of female sex hormone synthesis disorders.