

The Effect of Herbicide Paraquat and Organophosphate Pesticide Malathion on Changes of Sex Hormones in Female Rats

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Abstract:

Paraquat is an herbicide with a liquid formulation and dark green color. It is used in lands as a general, contact and leaf-poisoning. Herbicide paraquat “Gramaxon” has high toxicity after preparation and is absorbed through the skin. Malathion is a contact insecticide which is effective on pests through digestive and respiratory systems. Since both materials are abundantly used in agriculture today, and agricultural products are daily used by human, so, the toxins directly and indirectly have adverse influence on different body systems, especially on reproductive system. So, this study is aimed to investigate herbicide paraquat and organophosphate pesticide malathion on changes of LH, FSH, estrogen, and progesterone hormones in female rats. a number of 80 adult female Wistar rats were used in this study. They at first divided into control, blank, experimental paraquat, and experimental malathion groups. Each of the experimental groups were subdivided then into 3 groups of 10 each including, experimental P1 (daily received 1 mg/kg paraquat), experimental P2 (daily received 2 mg/kg paraquat), and experimental P3 (daily received 4 mg/kg paraquat); and experimental M1 (daily received 10 mg/kg malathion), experimental M2 (daily received 20 mg/kg malathion), experimental M3 (daily received 40 mg/kg malathion). Malathion and paraquat toxins were injected using insulin syringe. Variations

of LH, FSH, estrogen, and progesterone hormones were measured by ELISA test. hormonal measuring results in groups receiving paraquat indicate that the concentrations of FSH hormone in all experimental groups have significant increase compared with the control group. Progesterone hormone levels in experimental P1 and P2 groups have significant reduction and significant increase compared with the control group, respectively. Obtained results in groups receiving malathion show that LH hormone levels in different groups have no significant change compared with the control group ($p < 0.05$), however FSH hormone levels in these groups have significant increase compared with the control group. Estrogen hormone levels in experimental M1 and M2 groups have significant decrease and there is no significant change in the levels of estrogen hormone in experimental M3 group. Progesterone hormone levels show significant decrease in the experimental groups compared with the control group ($p < 0.05$). the results of this research indicate that herbicide paraquat and organophosphate pesticide malathion by production of free radicals, probably have adverse effects on sex hormones of female rats and oogenesis process.

Keywords:

Paraquat; Malathion; Sex Hormones; Rats