In vivo and in vitro effects of graded doses of the pesticide heptachlor on female sex steroid hormone production in rats

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Abstract

Adult female Sprague-Dawley rats were injected with corn oil or 5 mg, 20 mg, 25 mg or 30 mg per kg body weight of heptachlor solution every other day for up to 18 days. The rats were killed at the end of the experimental period, and blood samples were assayed for progesterone and oestrogen by radioimmunoassay. Ovarian cells from the rats were isolated and incubated either on their own, or in the presence of LH or FSH, and production of progesterone and oestrogen determined. Control incubations consisted of cells from corn oil-treated rats. The latter were also incubated on their own or in the presence of LH or FSH. Heptachlor significantly suppressed blood progesterone and oestradiol levels ($P < 0.05$ to $P < 0.001$), the degree of suppression depending on the dose and the stage of the oestrous cycle in which samples were obtained. Production of oestradiol by ovarian cells from heptachlor-treated rats was lower than for corn oil-treated controls. Cells from rats treated with low doses of heptachlor (5 mg per kg body weight) showed an increased production of progesterone, while high doses (> 20 mg per kg body weight) suppressed production.