INFLUENCE OF PROGESTERONE ON CELLULAR METABOLISM IN THE RAT UTERUS

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It has been shown that endogenous and exogenous oestradiol stimulates RNA and protein synthesis. A marked activation of fructose-1,6-diphosphate aldolase and of some key enzymes (glucose-6-phosphate dehydrogenase, 6-phosphogluconate dehydrogenase) of the pentose phosphate shunt was found. Furthermore in normal cycling rats a depressive action of progesterone on the latter parameters could be suspected. It appeared therefore of interest to study the effects of progesterone administration on these parameters in castrated female rats. The oestradiol-induced stimulation of enzyme activities was partly inhibited by 1 mg progesterone given 48 hours after starting the oestradiol treatment with physiological doses. This effect was statistically significant in the case of the activity of fructose-1,6-diphosphate aldolase, glucose-6-phosphate dehydrogenase and 6-phosphogluconate dehydrogenase. If progesterone treatment was started together with oestradiol treatment, only the oestradiol-induced activity increase of glucose-6-phosphate dehydrogenase and of 6-phosphogluconate dehydrogenase was partly inhibited. Higher doses of progesterone (5 mg every 12 h) had no inhibitory effect on enzyme induction by oestradiol. 1 mg doses of progesterone alone given at 12 intervals had no significant influence on enzyme activities, except in the case of malate dehydrogenase activity, which was suppressed. 5 mg doses of progesterone stimulated the glucose-6-phosphate dehydrogenase, the fructose-1,6-diphosphate aldolase and the isocitrate dehydrogenase activities. Data on the influence of progesterone on RNA, DNA and protein content will also be presented.