

Functional luteolysis in response to hydrogen peroxide in human luteal cells

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To evaluate the effect of reactive oxygen species in human corpus luteum function, we investigated whether hydrogen peroxide (H₂O₂) affects the in vitro luteal cell production of steroids. H₂O₂ treatment (1.0-100 μ M) of mid and late luteal cell cultures elicited a dose-dependent decrease in basal progesterone production. However, treatment of mid luteal cells with a low concentration of H₂O₂ (0.01 μ M) significantly stimulated progesterone secretion ($P < 0.05$). In addition, H₂O₂ (100 μ M) markedly inhibited human chorionic gonadotropin (hCG)-stimulated progesterone and estradiol secretion. cAMP production was enhanced (2.4-fold, $P < 0.05$) by hCG treatment of luteal cells. The addition of H₂O₂ (0.1-100 μ M) to hCG-stimulated luteal cell cultures elicited a decrease in cAMP concentration ($P < 0.05$) and in the specific binding of radiolabeled hCG by luteal cells. Progesterone and estradiol production stimulated by dibutyryl cAMP were significantly inhibited by H₂O₂ ($P < 0.05$). These findings