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JOURNAL ARTICLE

The role of endogenous opioid peptides in the control of androgen levels in the male nonhuman primate

P. M. Gilbeau, R. G. Almirez, J. W. Holaday and C. G. Smith

Plasma androgen levels studied following the injection of the opioid agonists morphine sulfate (0.5-1.0 mg/kg), beta-endorphin (10-20 mg/kg), and [D-Ala2, D-Leu5]-enkephalin (DADLE; 5-20 micrograms/kg), and the opioid receptor antagonist naloxone (0.5-2.0 mg/kg) in nonrestrained adult male rhesus monkeys. Drugs were administered and blood samples were collected through indwelling jugular catheters. Morphine (1.0 mg/kg) and DADLE (10.0 micrograms/kg) decreased androgen levels by 70% and 34%, respectively. Significant decreases occurred 80 minutes after drug injections, and levels remained depressed for 180 minutes; beta-endorphin (20 micrograms/kg) produced no effect on androgen levels. Treatment with naloxone (0.5 mg/kg-2.0 mg/kg) alone produced marked increases in androgen levels. Peak hormone levels occurred 80 minutes after naloxone administration and remained elevated for up to 2 hours. The depressant effects of morphine and DADLE on androgen levels were completely reversed by the administration of naloxone (1.0 mg/kg). In monkeys pretreated with hCG, neither morphine (1.0 mg/kg) nor DADLE (20 micrograms-kg) had any effect on androgen levels for up to 3 hours after opioid administration. Administration of morphine or endogenous opioid peptides exerts negative effects on androgen levels, whereas antagonism or endogenous or exogenous opiates by naloxone results in increases in circulating androgens. These results support a physiologic role of the endogenous opioid peptides in primate reproductive function.