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Opioid Modulation of the Pre-ovulatory LH Surge in the Conscious Rat: Involvement of Indolamines

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Abstract: Endogeonus opioid peptides play an important role in the generation of the pre-ovulatory LH surge. We investigated the interrelationship between the oploid and indolaminergic systems in the regutalion of LH secretion, and the involvement of μ-and κ-opioid subtypes in this process. Concsious female rats bearing cannula in the femoral artery were injected intraperitoneally with μ-(diamorphine) and κ -(U-50488H) opioid agonists either alone or with their respective antagonists, naloxone and MR2266, on pro-oestrus. Blood samples were collected hourly between 15.00 and 19.00 and plasma LH levels were measured by RIA. 5-HT and 5-HIAA concentrations were determined by HPLC-ECD in the MPOA, SCN, ME and ARN. One-Way ANOVA was used to examine the results. Both μ- and κ- agonists inhibited the pre-ovulatory LH surge. Naloxone prevented the suppressive effects of diamorphine on LH release, but MR2266 did not prevent the effects of U-50488H. Concentrations of 5-HT and 5HIAA were selectively reduced by the μ-and κ -agonists in the specific regions of the hypothalamus. Naloxone and MR2266 negated the inhibitory effects of diamorphine and U-50488H in an area-dependent manner. Only diamorphine lowered the ratio of 5-HIAA/5-HT in the MPOA, and these effects were reversed in the same hypothalamic region following its co-administration with naloxone. The present results indicate that both μ- and κ -opioid receptor subtypes may be involved in the inhibition of the LH surge. The physiological significance of an indolaminergic involvement in the opioid control of LH release appears to be minor.

Key Words: Indolamines, opioid receptors, LH surge and HPLC-ECD.

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