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JOURNAL ARTICLE

Negative feedback regulation of pulsatile LH secretion during treatment with an LHRH antagonist in rams

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Suppression of LH and testosterone secretion in sexually active rams by the short-term administration of an LHRH antagonist results in a compensatory increase in the release of LHRH from the hypothalamus. This is inferred from the observed increase in the frequency of LH pulses in peripheral blood during the period of recovery when the pituitary regains its responsiveness to LHRH. To investigate the nature of the inhibitory feedback signal which triggers this compensatory response, a single intravenous injection of 1 mg of an LHRH antagonist (28 micrograms/kg; N-Ac-D-pCl-Phe 1, D-pCl-Phe 2, D-Trp 3, D-hArg (Et 2) 6, D-Ala 10, LHRH) was given to groups of intact, testosterone-implanted castrated and castrated rams housed under stimulatory short days. Pulsatile LH secretion was monitored in blood samples collected every 10 min for 34 h. The treatment caused an immediate blockade of LH pulses in all three groups of rams followed by a progressive recovery of LH secretion from 12-30 h. Compared to the pretreatment period, intact rams showed a significant increase in frequency of LH pulses during the recovery period. Castrated rams did not show this increase, with or without supplementary testosterone. Since the circulating testosterone concentration decreased after the blockage of LH secretion in the intact rams, but not in the castrated or testosterone-implanted castrated rams, we conclude that it is the reduction in the steroid negative feedback signal which leads to a compensatory increase in the activity of the LH pulse generator.

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