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EFFECT OF A GONADOTROPIN-RELEASING HORMONE AGONIST ON LUTEINIZING HORMONE RECEPTORS AND STEROIDOGENESIS IN OVARIAN CELLS*

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Objective: To examine the effect of a gonadotropin-releasing hormone agonist (GnRH-a), leuprolide acetate (LA), on human chorionic gonadotropin/luteinizing hormone (LH) receptors content and progesterone (P) and estradiol (E₂) production in cultured granulosa or luteal cells.

Design: Prospective.

Setting: Private Fertility Clinic and National Research Institute.

Patients: Twenty patients undergoing in vitro fertilization or gamete intrafallopian transfer programs.

Results: Human chorionic gonadotropin/LH receptors in human granulosa cells increased after 48 hours of culture, and LA inhibited such effect. Leuprolide acetate, 1 ng/mL, in the cultures produced an increase in P production. On the contrary, LA inhibited E₂ production. Additionally, the in vivo effect of LA (2 µg/rat per 7 days) was studied in corpus luteum of superovulated rats. Luteal cells from LA-treated rats in culture produced lower P than the controls but showed an increase in aromatase activity. Luteal LH receptors declined after 48 hours of culture with LA.

Conclusion: The high doses of gonadotropin necessary to induce ovarian hyperstimulation when GnRH-a is administered could be related with an inhibitory effect of these agonists on LH receptors and aromatase activity. Fertil Steril 1993;59:803-9

Key Words: GnRH -a, granulosa cells, LH receptors, steroidogenesis, luteal cells