Coordination of antral follicle growth: basis for innovative concepts of controlled ovarian hyperstimulation.

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Abstract
Among the key objectives of controlled ovarian hyperstimulation (COH) is the achievement of adequate coordination of multiple follicular growth to trigger ovulation when most of follicles have reached concomitant maturation. However, during the early follicular phase, early antral follicles present noticeable size heterogeneities that may be amplified during COH. To challenge the hypothesis that this phenomenon results, at least in part, from the early exposure of antral follicles to gradient follicle-stimulating hormone (FSH) levels during the preceding late luteal phase, we conducted three clinical studies. First, we artificially lowered luteal FSH levels by administering estradiol (E2) and measured follicular characteristics on the subsequent day 3. Second, we verified whether luteal E2 administration could promote the coordination of follicular growth during COH and improve its results. Third, we assessed the effects of premenstrual gonadotropin-releasing hormone (GnRH) antagonist administration on follicular characteristics during the early follicular phase. Our results showed that luteal FSH suppression by either E2 or GnRH antagonist administration reduces the size and improves the homogeneity of early antral follicles during the early follicular phase, an effect that persists during COH. Coordination of follicular development may optimize ovarian response to short GnRH agonist and antagonist protocols, and constitutes an attractive approach to improving their outcome.

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