Role of macrophage colony-stimulating factor (M-CSF) in human non-luteinizing granulosa cells

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Context: Previously we reported that macrophage colony-stimulating factor (M-CSF) could stimulate the production of estradiol (E2) and progesterone (P) in luteinized granulosa cells (GCs), and its secretion could be regulated by follicle-stimulating hormone (FSH). This study was designed in an attempt to examine the effect of M-CSF alone or with tamoxifen on the function of non-luteinizing granulosa cells (COV434 cell lines) and its interaction with FSH.

Objective: To confirm the function of M-CSF in follicular development and ovulation.

Methods: In vitro experimental study was used and M-CSF and FSH were added to the culture media of non-luteinizing granulosa cells.

Main Outcome Measure(s): Expression levels of FSH receptor, M-CSF, M-CSF receptor, and E2 were detected by quantitative RT-PCR.

Results: The production of FSH receptors was enhanced by M-CSF in vitro in a dose-dependent manner. Conversely, FSH was able to promote the expression of M-CSF and its receptor when present in an appropriate concentration. Both FSH and M-CSF stimulated the production of E2 by COV434 cells.

Conclusions: M-CSF may play an important role in regulating the response of granulosa cells (GCs) to gonadotropins in the early phase of follicular development. M-CSF can also increase the generation of estrogen before GCs become luteinized, which may be helpful in the process of ovulation.