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The Interaction between Epidermal Growth Factor (EGF) and Follicular Stimulating Hormone (FSH) on Nuclear Maturation of Mouse Oocytes by Using Their Inhibitor

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The stimulatory effect of EGF and FSH on oocyte maturation have been reported in various mammalian species. And some reports presented FSH enhanced the effect of EGF on oocyte maturation. But,the interaction between EGF and FSH on nuclear maturation of mammalian oocytes is not fully understood. We observed the effect of EGF and FSH on nuclear maturation during in vitro maturation of mouse oocytes. Also, we examined the interaction between EGF and FSH on nuclear maturation of mouse oocytes using the EGFR inhibitor or FSH inhibitor. Germinal vesicle (GV) stage oocytes were obtained from 3-4weeks PMSG primed BCF1 hybrid mice and cultured in TCM-199 medium with 0.4%PVP supplemented with/without EGF (1ng/ml), FSH (1ug/ml) , EGFR specific tyrosine kinase inhibitors: Tyrphostin AG 1478 (500nM), MAP kinase kinase inhibitor : U0126 (20uM) or PD 98059 (100uM) for 14-15hr. Rapid staining method were used for the assessment of nuclear maturation. Nuclear maturation rates of EGF and/or FSH-treated group were significantly higher than those of control group. Treatment of EGFR inhibitor significantly block the nuclear maturation of GV oocyte in EGF-treated group, but it did not block those of GV oocyte in FSH-treated or FSH and EGF-treated group. Treatment of FSH inhibitor(U0126, PD98059) significantly block the nuclear maturation of EGF-treated group, FSH-treated and FSH and EGF-treated group. These results show that EGF has a stimulatory effect as well as different action pathway with FSH on in-vitro maturation of mouse oocyte in vitro. Therefore, further studies will be needed to find the signaling pathway of EGF associated with nuclear maturation.

Key words) ***EGF, FSH, EGFR inhibitor, FSH inhibitor,maturation***