

Emerging role of angiogenesis in reproduction

Yuji Taketani

Medical University of Toyko, Japan

Sequential occurrence of angiogenesis is thought to be essential in mammalian female reproductive organs. In recent years, a number of angiogenic factors involved in reproduction have been identified and characterized. We demonstrated the presence of angiogenin, an angiogenic factor, in the human ovary and endometrium. We demonstrated that human follicular fluid contains considerable amounts of angiogenin produced by granulosa cells. The production of angiogenin by granulosa cells was stimulated with the addition of human chorionic gonadotropin or dbcAMP or under a hypoxic milieu. Concentrations of angiogenin in follicular fluid from individual follicle were positively correlated with those of progesterone, but not estradiol and testosterone. The expression of angiogenin protein was also demonstrated in the human endometrium using Western blot analysis. The levels of the expression were increased by 3- to 4- fold at the mid-, late-secretory phase and early gestation relative to the proliferative phase. Consistent with these *in vivo* results, decidualized cultured stromal cells by being treated with progesterone or progesterone plus estradiol secreted significantly increased amounts of angiogenin compared with untreated or estradiol treated groups. Both the treatment with dbcAMP and hypoxic conditions stimulated angiogenin secretion by cultured stromal cells. Interestingly, in an epithelial cell culture system, hypoxia stimulated angiogenin secretion, whereas dbcAMP had no appreciable effect. These results suggest that angiogenin has a role in angiogenesis in human reproductive organs in concert with other hitherto identified angiogenic factors.