

D-13 Involvement of fas-antigen gene expression in atretic ovarian follicles induced by superovulatory doses of PMSG

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In mammals, most of the ovarian follicles present at birth are destined to be degenerated by atresia during life time. But the reason why the follicles are degenerated by atresia is not solved yet. Recent studies demonstrated that apoptosis(programmed cell death) was involved in atresia and fas-antigen had a role in apoptosis. Therefore, we designed to study the relationship between fas antigen gene expression and apoptosis in atretic follicles of immature female rats treated with varying doses(4, 20, and 40IU) of PMSG. After treatment, ovaries were collected and analysed by RT-PCR method to determine the fas-antigen expression. The fas-antigen mRNA level was decreased at 72 hr in control animals(4IU PMSG). In 20IU PMSG-primed rats, mRNA levels were decreased at 12, 54, and 60hr. And levels of fas-antigen mRNA were decreased at 24, 54, and 60hr in rats treated 40IU of PMSG. Based upon these results, we concluded that fas-antigen gene is expressed before the follicles become atretic. The fas antigen expression in granulosa cells seems to be a prerequisite and early process of granulosa cell apoptosis, and then nuclear DNA fragmentation occurs. Both processes might be occurred by atretogenic factors of the granulosa cells.

D-14 Evaluation of granulosa cell apoptosis of atretic follicles induced by superovulatory doses of PMSG in immature female rats

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In the mammalian ovary, greater than 99% of the follicles present at birth are destined to degenerate by atresia during life time. Recent studies indicated that apoptosis(programmed cell death) was involved in atresia of ovarian follicles. To investigate the relationship between gonadotropin dosage and apoptotic changes in atretic follicles, immature female rats were injected with varying doses(4, 20, and 40IU) of PMSG. After treatment we analysed the ovulation rate, oocyte maturity, fertilizability, steroid hormone profile, DNA fragmentation pattern and histological findings. The ovulation rate of PMSG-treated rats showed dose-dependent increase. But more number of degenerated oocytes were observed in higher dose treated group. However, the fertilized 2-cell embryos developed into blastocyst without any degeneration. The nucleosomal DNA fragmentation of granulosa cells was considered to be increased in time- and dose-dependent manner. The histological atretogenic change was increased in time- and dose-dependent manner. Therefore, we concluded that granulosa apoptosis involved in follicle atresia was induced by superovulatory doses of gonadotropin in time- and dose-dependent manner.