

Comparison of the level of apoptosis in the mid-secretory human endometrium

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Introduction: Apoptosis (programmed cell death) is based on a genetic mechanism that induces a series of cellular, morphological and biochemical alterations leading to cell suicide. Apoptosis plays a role in physiological functions of female reproductive tissues as it represents an essential regulating factor for the endometrial cycle.

Material & methods: Samples of secretory endometrium (n = 28) were obtained from 14 women on days 5 and 7 after ovulation. The inclusion criteria of the study group were: a history of infertility of more than 12 months, regular menstrual cycles, age below 40, and FSH basal level range 5-9 IU/L. Ovulation was confirmed by LH surge and repeated ultrasound examinations. .

Apoptosis was detected using TUNEL assay in four particular structures (epithelial surface, stroma and glands separately in spongy and compact layers of the endometrium). For quantifying the level of apoptosis according the expression, samples were divided within 7 categories (0%, up to 10%, up to 20%, up to 35%, up to 50%, up to 75%, more than 75%). A statistical analysis was performed using the chi-square Goodness-of Fit test.

Results: The level of apoptosis in the endometrial epithelial surface was significantly higher on day +7 compared to day +5 after ovulation ($P < 0.02$). Apoptotic cells were seen only sporadically in endometrial stromal cells. The level of apoptosis in endometrial stroma was also higher (but not statistically significant) on day +7 compared to day +5. The level of apoptosis was markedly higher in spongy layer on day +7 ($P < 0.01$) compared to day +5. There were no significant differences between days +5 and +7 in compact layers of the glands.

Conclusions: The results of our study indicate that the level of apoptosis increases towards the end of menstrual cycle and may be related to regular endometrial cell replacement.