

CELL DEATH OF THE THECA INTERNA DURING BOVINE OVARIAN FOLLICULAR ATRESIA

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It is generally accepted that death of cells within the theca interna occurs late during ovarian follicular atresia. Histological classifications of atresia are usually based solely upon the morphology of the membrana granulosa. Atresia of bovine antral follicles less than 5 mm in diameter has been redefined as either antral or basal atresia depending on where in the membrana granulosa cell death is initiated. The aim of present study was to investigate changes within the theca interna during both antral and basal atresia. Bovine ovaries were collected and processed for light microscopy and immunohistochemistry. Each follicle less than 5 mm was classified as either healthy, antral atretic or basal atretic, with antral atresia being further classified either early-mid or late stage. Sections were labelled by TUNEL to identify dead cells combined with lectin from *Bandeiraea simplicifolia* to identify endothelial cells or with an antibody to cytochrome P450 cholesterol side-chain cleavage to identify steroidogenic cells. The numerical density of steroidogenic cells within the theca interna was significantly reduced ($P < 0.001$) in basal atretic follicles compared to healthy and antral atretic follicles. In both antral and basal atresia there was death of endothelial cells and steroidogenic cells. However cell death was greater in endothelial cells ($P < 0.05$) and steroidogenic cells ($P < 0.001$) of the theca interna of basal atretic follicles. There was no significant difference in the amount of cell death in the membrana granulosa between early-mid antral atresia and basal atresia while death of the membrana granulosa was significantly increased in late antral atresia compared to basal atresia ($P < 0.01$). Therefore we conclude that basal atresia is not a progression of antral atresia and that the theca interna can be susceptible to cell death early in atresia in basal atretic follicles.