

THE EFFECT OF CRYOPRESERVATION ON FOLLICULAR DEVELOPMENT IN HUMAN OVARIAN TISSUE

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Aims/Objectives: To investigate the effects of cryopreservation on the expression of 3 proteins involved in the regulation of follicular growth in xenotransplanted human ovarian cortical biopsies.

Content of presentation: This presentation will summarise the impact of cancer treatment on fertility in women, the study aims, methods used, main outcomes and discuss their significance.

Relevance/Impact: Recent progress in cancer therapy has significantly decreased mortality rates. However, these therapies whilst curative can cause significantly reduced fertility or sterility. Current fertility preservation methods are limited to women who either have a partner or who use donor sperm and without a hormone sensitive tumor. Ovarian tissue transplantation could offer an alternative for these patients. Unlike other studies, we assessed the impact of cryopreservation on follicular development in post-pubescent ovarian tissue.

Methods: Ovarian biopsies from women undergoing cesarean section were used for fresh and cryopreserved xenografting into nude mice and left for 145 days. The mice were stimulated with gonadotropins and Ki67, AMH and FSH receptor immunostaining was carried out and quantified

Outcomes: Fresh biopsies produced a greater number of follicles but those from cryopreserved biopsies reached more advanced developmental stages. Expression of MIB-1 and FSH receptor staining was higher in follicles of the cryopreserved samples than in the fresh, but AMH staining was 40% greater in fresh biopsies. 37.5% of fresh biopsies developed a corpus luteum (CL) and 12.5% presented with calcification compared with 10% and 50% respectively in cryopreserved biopsies.

Discussion: This study was first to use FSH receptor staining to validate follicular staging and quantitatively analyse IHC results using Adobe Photoshop CC 2014. Overall the number of follicles found in both fresh and frozen biopsies was markedly less than in similar studies published by David et al., 2012 & Luyck et al., 2013. The reasons for this are not clear, as the protocol for stimulation in the nude mice was the same as previous like studies. In summary the results demonstrate accelerated development through to corpus luteum in fresh biopsies and cryopreservation interfering with follicular growth and development. Moreover, increasing susceptibility to ischemic damage as reduced oxygen supplies cause calcification of the ovarian tissue, which appears to disrupt follicular growth and development.