Follicular viability in cryopreserved whole ovine ovary after transplantation with microvascular anastomosis

Author Block: J. Banerjee, R. K. Sharma, W. Choi, A. Agarwal, T. Falcone, A. T. Grazul-Bilska; Cleveland Clinic, Cleveland, OH

Objective: Premature ovarian failure is a known cause of loss of fertility in young women with cancer undergoing chemotherapy or radiotherapy. Ovarian tissue cryopreservation is one of the methods to preserve fertility. The objective of this study was to examine the follicular status in post-transplant cryopreserved and thawed whole ovine ovaries.

Design: A prospective study
Materials and Methods: Dorset / Suffolk crossed ewes were divided into control (n = 5) group with intact ovaries and treated group (n = 5) where ovaries were removed and transplanted. Of the 5 test ewes, 4 had their ovaries with vascular pedicles cryopreserved and thawed before transplantation and 1 ewe had its ovaries directly transplanted back after removal without cryopreservation (positive control). Both ovaries with vascular pedicles were removed laparoscopically, cryoperfused and cryopreserved using a slow freezing method before storing in liquid nitrogen. After one week, the ovaries were thawed and transplanted back in the same ewe at a different site with the deep epigastric vessels. After 3 months, the ovaries were removed surgically from both control and treated group and examined for histological changes using hematoxylin and Schiff’s reagent staining and detection of apoptosis by TUNEL method.

Results: All 5 control ewes demonstrated effects of stimulation and an average of 5 oocytes per stimulated ovary were retrieved. Of the 5 test ewes, 2 ewes (1 from positive control and 1 cryopreserved tissue) demonstrated stimulated ovaries with retrievable oocytes. One additional ewe with a cryopreserved ovary did not show evidence of stimulation but provided enough tissue for histological assessment. The morphology of the control and the transplanted ovaries was comparable. Viable follicles at a primordial stage were seen in the third test ewe and the 2 transplanted ewes demonstrated viable primary and secondary follicles with small evidence of fibrosis. The granulosa-theca cell layers were prominent and comparable to controls along with a healthy antrum formation. Proliferating cells were detected in ovarian follicles and the rate of apoptosis was minimal in both control and autotransplanted ovaries.

Conclusion: Ovarian cryopreservation and autotransplantation of whole ovaries in the sheep model demonstrates viable follicles at different stages of maturation. This might serve as a potential source of oocytes or follicles for assisted reproduction or in-vitro maturation in cancer patients as an effort to reestablish fertility. However additional improvements are necessary to further enhance the efficiency of autotransplantation of frozen-thawed ovaries.
Financial Support: Cleveland Clinic

Author Disclosure Block: J. Banerjee, None; R.K. Sharma, None; W. Choi, None; A. Agarwal, None; T. Falcone, None; A.T. Grazul-Bilska, None.

Category (Complete): Preservation of Fertility (PFSIG)

Topic (Complete):

Topic: Cryopreservation – gametes

Additional Information (Complete):

Presenting Author Fellow: No

ACCME Disclosure: I will not be discussing non-FDA approved products

I agree: True

Status: Complete

If you have any questions or experience any problems with the 2006 ASRM Abstract Submitter, please contact Customer Service at asrm@dbpub.com or call (800) 375-2586 or (617) 621-1398. Customer Service hours of operation: Monday-Friday, 9:00 AM-6:00 PM EDT.

Powered by OASIS, The Online Abstract Submission and Invitation System SM © 1996 - 2006 Coe-Truman Technologies, Inc. All rights reserved.