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Comparison of DMSO protocol and PROH protocol for slow cryopreservation of ovarian cortex tissue by novel ultra structural scoring of early tissue

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INTRODUCTION:
The cryopreservation and transplantation of ovarian tissue have been shown to restore ovarian function temporarily and may also preserve the fertility of young female cancer patients until after their sterilizing cancer treatment.

AIM:
Develop an ovarian tissue cryopreservation and re-transplantation protocol aiming to restore ovarian function in young female cancer patients undergoing sterilizing cancer therapies in South Africa. Comparison of two well-known slow freezing protocols using dimethyl sulfoxide (DMSO) and propanediol (PROH) effects on the ultra-structure of early cryopreserved follicles.

MATERIALS AND METHODS:
Consenting patients at Tygerberg Hospital aged 21 to 42 years, with normal hormonal profiles (LH, FSH and E_2) at the time of the study, diagnosed with either squamous cervical carcinoma or fallopian tube carcinoma scheduled for curative, but sterilizing chemotherapy and/or radiotherapy. Ovarian tissue were divided equally into both protocols and subsequently thawed and fixed for electron microscopy. Cryodamage of the various ultra-structures were evaluated and scored.
ANONVA and Post Hoc analyses were done to compare scores where $p<0.05$ indicated statistical difference.

RESULTS:
Comparison of the scores of the evaluated ultra-structures mostly showed that the PROH protocol tend to induce more extensive damage after equilibration and cryopreservation than the DMSO protocol. Preliminary heterotransplantation results indicated recovery of hormonal function and follicular growth.

CONCLUSION/DISCUSSION:
DMSO protocol seemed to cryopreserve cell structures slightly better, noticeable in individual ultra-structures, but larger samples sizes may be needed. Preliminary results show the ovarian tissue cryopreserved in either of the protocols in the study had restored endocrine function 8-9 months after transplantation which lasted for 6-12 months.