TRANSPLANTATION OF WHOLE CRYOPRESERVED PIG OVARIES INTO NUDE RATS AS A NEW EXPERIMENTAL MODEL
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Background

Transplantation of cryopreserved ovarian tissue is a promising strategy to restore fertility in cancer patients. However, ischaemia following ovarian tissue grafting can lead to significant follicular loss. Transplantation of the whole ovary by vascular anastomosis has been considered as a method of preventing ischaemic damage. In this study the feasibility and function of transplanting frozen-thawed ovary with intact vasculature were evaluated.

Methods

We investigated this strategy in a swine-rat model. Whole swine ovaries with their vascular pedicles were perfused with DMSO and frozen by a slow-freezing method. After thawing the ovaries were either transplanted as intact ovaries by anastomosis into radiated nude rats or ovarian tissue stripes were transplanted. Further whole fresh ovaries were transplanted.

Results

From a total of 40 female transplant recipients, two died directly after surgery. All animals that survived were healthy and the ovaries were not rejected. Light microscopy revealed well-preserved morphology in all groups. The highest density of viable follicles was seen in fresh ovaries, although the median of this group was not statistically significantly higher than that of the other groups. The density of apoptosis was highest in the whole cryopreserved ovaries.

Conclusion

Up to date the results of whole ovary freezing and transplantations in comparison to ovarian tissue freezing and transplantation are not sufficient, whereas the idea that after transplantation of whole ovaries the ovarian function can be restored for a very long period is promising. Cryopreservation of whole pigovary is possible and this shows that the transplantation of whole human ovaries into nude rats should be possible. Therefore this model is suitable to make experiments with human ovaries in order to improve whole ovary freezing.