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Freeze-storage egg banking for egg donation treatment

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The rapid freezing technique of vitrification is set to revolutionise egg donation as a fertility treatment by enabling freeze-storage egg-banking. The cryopreservation of eggs was one of IVF's continuing challenges until the widespread introduction of vitrification; the older slow freezing methods induced the formation of ice crystals, which could cause damage to several structures of the egg. Thus, as demand for egg donation increases as a treatment for age-related infertility, egg banking with vitrification can theoretically provide a large pool of donor eggs without the present need for collection, fertilisation and transfer in a "fresh" treatment cycle (in which the donor and recipient's cycles are hormonally synchronised).

There is now increasing evidence that egg banking with vitrification is a viable process in egg banking programmes. However, little is known about success rates and how many vitrified eggs a recipient will need to maximise her chance of pregnancy - questions which are now answered in a study reported today at the Annual Meeting of ESHRE in Munich by Dr Ana Cobo of the Valencia Infertility Institute (IVI) in Valencia, Spain, one of the few clinics worldwide to have introduced an egg banking programme for its egg donation and fertility preservation patients.

The study took as its endpoint "cumulative live birth rate", which Dr Cobo described as a "pragmatic" measure of success and one which most closely reflects the aims and experience of everyday patients.(1) The study analysed the experience of more than 3400 patients using an egg

bank for egg donation treatment (and more than 40,000 vitrified oocytes) and found that cumulative live birth rates (CLBR) were high and increased progressively according to the number of eggs used in the treatments, and then reached a plateau.

Thus, CLBR was found to be 39.4% when a total of ten vitrified eggs were used in the treatments, and 75.9% when a total of 20 eggs were used. But this rapid rate of increase slowed when 30 eggs were used, to 88.7%, and thereafter reached a peak with the use of 40 vitrified eggs at 97.3%.

These results, said Dr Cobo, provide the first pragmatic indication of how eggs, their donors and those receiving them as patients might be managed in a freeze-storage egg bank, and the first evidence that the probability of having a baby increases progressively according to the number of oocytes consumed. This increase is rapid until oocyte numbers reach 10-12, and slower from the 20th onwards, reaching a plateau close to 100% when 40 vitrified oocytes have been used.

The findings, she added, also give some indication to those freezing eggs for fertility preservation just how many eggs might be needed from IVF and egg collection to maximise the chance of future delivery.

Dr Cobo explained that since the establishment of the egg banking programme in Valencia more than 50,000 oocytes have been warmed for use in 4907 donation cycles. Last year alone 946 donors vitrified 10,690 oocytes for the egg bank. The mean number of oocytes donated per donation cycle is around 11, which means that around four donation cycles and the use of around 40 oocytes will be necessary for the highest chance of success.

The advantage of freeze-storage, she added, "is that the whole procedure is more efficient", as no synchronisation between donor and recipient is

required. "In addition," she said, "there is the possibility of having a greater availability of stored oocytes from donors tested for a genetic condition or rare blood type, and, most importantly, the donation would be safer because of the quarantine period."

Already, Dr Cobo and colleagues in Italy have verified the viability of vitrified oocytes in IVF, showing in a large randomised trial that eggs warmed after vitrification performed just as well in IVF (comparable pregnancy rates) as fresh eggs and embryos. As yet, however, there is little data on using vitrified oocytes for fertility preservation. But, she said, the information currently being gathered in egg banking programmes will be useful as a guide to what to expect from oocyte vitrification in young women who have chosen this option for fertility preservation.

More information: Abstract O-259: Cumulative live birth rates (CLBR) according to the number of vitrified oocytes consumed in an ovum donation (OD)/egg-banking program

Notes

1. Cumulative live birth rate describes birth rate after several attempts and is usually considered a measure of treatment success most consistent with everyday practice. Studies show that CLBR tends to increase with the first additional treatment cycles but to level off thereafter. Cumulative rates, says Dr Cobo, have been considered lately as a much more accurate measure to evaluate the probability of success, allowing the precise description of the rhythm at which live births are attained.

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