VITRIFICATION OF GAMETES AND EMBRYOS

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Although it seems that vitrification technology has made significant advancements and holds great promise, many issues remains to be addressed before it becomes a safe procedure in clinical laboratories, such as the fact that vitrification of oocytes and embryos may not require a high concentration of cryoprotectant in the vitrification solution when it has a suitable cooling and warming rate. There is also no consistent evidence that indicates the absence of risk to the vitrified oocytes when they are stored for a prolonged period of time in direct-contact with liquid nitrogen. The fate of recent adaption of animal protocols for one-step warming procedure is also discussed. In addition, the long-term development of infants born as a result of this technology equally remains to be evaluated.

THE QUALITY OF HUMAN EGGS AND PRE-IVF INCUBATION

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Multi-factors influence the success rate of infertility treatments, and one of the important points is to obtain good quality eggs. Egg quality is an important determinant in successful infertility treatment. In addition to maternal age, controlled ovarian hyperstimulation (COH) protocols also play a key role in affecting the quality of the egg. After egg retrieval, the insemination occurs 3-6 h after collection, with a pre-IVF incubation time by in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI) (39-42 h post-HCG injection). The pre-IVF incubation refers to the short period time of 3 to 6 h after oocyte retrieval and before the insemination by IVF or ICSI. The pre-IVF incubation of collected eggs in the designed culture medium improves egg quality in terms of maturation and early embryonic development. Pre-IVF incubation of the collected eggs contributes to the improvement of the quality of eggs; therefore, it may increase subsequent pregnancy and implantation rates following embryo transfer.

UPDATES ON IVM TECHNOLOGY IN HUMAN IMMATURE OOCYTES FOR CLINICAL APPLICATION

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Recent progress in in vitro maturation (IVM) technology using human immature oocytes for clinical applications has been reported. The success rate of IVM technology depends on the source of immature oocytes, and to date, no single protocol has demonstrated superior results over others. Attempts to adapt IVM protocols developed in animal models have not let to significant breakthroughs in culture conditions and systems.
Cumulus cells are known to play an important role in oocyte maturation; however, the results of co-culture with different type of cells for IVM of human immature oocytes remain controversial. As one of the assisted reproductive technology (ART) techniques, IVM is only involved in a specific procedure for infertility treatment and fertility preservation. With development of IVM technology, it has been proposed that the combination of mild-stimulation cycle with retrieval of both mature and immature oocyte, followed by IVM, may offer a viable alternative to the conventional stimulation cycle treatment.