Oocyte cryopreservation outcomes including pre-cryopreservation and post-thaw meiotic spindle evaluation following slow cooling and vitrification of human oocytes

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Objective: To report our oocyte cryopreservation (OC) outcomes including meiotic spindle (MS) evaluation of metaphase II (MII) oocytes destined for OC and thaw.
Design: Retrospective.
Setting: University-based infertility center.
Patient(s): Women attempting pregnancy using cryopreserved oocytes.
Intervention(s): OC, MS evaluation.
Main Outcome Measure(s): Survival, two pronuclear (2PN) fertilization, achieving embryo quality suitable for transfer or refreezing, blastocyst formation.
Result(s): Thirty-two OC-thaw cycles resulted in 20 pregnancies, 18 either ongoing or delivered. In 26 cycles, MS evaluation was performed: 262/303 (86%) thawed/recovered oocytes survived, 218/262 (83%) achieved 2PN fertilization, 133/218 (61%) became suitable for day-3 and 122/218 (56%) for day-5 transfer. In total, 58 embryos were transferred resulting in a 62% pregnancy and a 41% implantation rate. Of oocytes evaluated before cryopreservation, 247 (82%) were spindle-positive; 96% of these were also spindle-positive after thawing. Blastocyst formation and suitability for day-5 transfer was achieved more often if a post-thaw spindle was visualized. Of all slow-cooled and vitrified oocytes, a higher percentage of those slow-cooled achieved 2PN fertilization and usability. MS evaluation of oocytes cryopreserved by either method was associated with similar outcomes.
Conclusion(s): OC outcomes are improving. An MS was almost always exhibited both before cryopreservation and after thawing, suggesting that, with appropriate technique, OC presents minimal harm to the MII oocyte. A meiotic spindle evaluation might help to further OC technology. (Fertil Steril® 2010; ■:■–■. ©2010 by American Society for Reproductive Medicine.)

Key Words: Oocyte cryopreservation, meiotic spindle, embryo competence, fertility preservation