

Vitrification and warming of blastocysts produces high implantation and pregnancy rates when compared to slow freezing.

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Introduction:

Vitrification is a promising technology for blastocyst preservation following in vitro fertilization (IVF). Preservation of blastocysts is a routine part of IVF treatment and has traditionally been accomplished using slow freezing with low concentrations of cryoprotectants. Vitrification has recently emerged as an alternative procedure in the preservation of oocytes and embryos and it may confer some time saving and survival advantages over the traditional procedure for blastocyst cryopreservation.

Objective:

This study evaluates the efficiency of a blastocyst vitrification program when compared to a slow freezing program.

Materials and Methods:

Blastocysts remaining after transfer were slow frozen or vitrified on day 5 and/or 6 post retrieval. Blastocysts at all stages of development (early, expanding, expanded and hatching) were slow frozen using a kit (Sage/CooperSurgical, Trumbull, CT) or vitrified using a kit (Irvine Scientific, Santa Ana, CA) and stored individually in 1/4 cc straws or cryotips immersed in liquid nitrogen. No artificial collapsing of blastocysts or other manipulations were performed during the procedure. Blastocysts were thawed or warmed on the equivalent of Day 4 in either a natural or controlled cycle and transferred after a short incubation. Pregnancy testing was performed 10 days later.

Results: The study evaluated 129 cycles of slow freezing with 259 embryos transferred and 65 cycles of vitrification and warming with 138 embryos transferred from January 2007 to the present.

	Slow freeze	Vitrification	P value
Cycles	129	65	
Embryos transferred (mean/patient)	259 (2)	138 (2.1)	NS
Pregnancies	33	39	
# sacs	36	52	
Clinical pregnancy rate (%)	25.6	60	P<0.005
Implantation rate (%)	13.9	37.5	P<0.000002

Discussion:

Vitrified embryos survive and implant at high rates after warming and transfer when compared to slow-frozen embryos. Although vitrification is technically a more challenging procedure, the benefits of the technology are immediately apparent. Vitrification has emerged as a viable alternative to slow freezing for human embryos at the blastocyst stage.

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