Clinical pregnancy rates are similar between fresh and DMSO-free vitrified blastocysts; a multi-center study.

Authors: James J. Stachecki[1], Sharon H. Anderson[2].

Affiliations: [1]Innovative Cryo Enterprises (ICE) LLC, Linden, NJ 07036; [2]Main Line Fertility Center, Bryn Mawr, PA.

Background: Although blastocyst vitrification is commonplace among IVF clinics, the need for a closed, easy-to-learn and use system remains. Using a DMSO-free system will help avoid possible cryoprotectant toxicity. Micro-volume containers and rapid procedure times remain technically challenging for some embryologists. The I.C.E. vitrification system relies on a relaxed protocol, closed device, and vitrification regime that is closer to equilibrium vitrification, and does not depend on ultra fast cooling rates and small volumes.

Objective: Compare pregnancy rates of fresh and vitrified blastocysts between eight clinics that use the ICE vitrification system.

Materials and Methods: Retrospective data was collected from eight IVF clinics. Blastocysts were 1) produced and transferred fresh or 2) vitrified, warmed, and transferred in a subsequent cycle. Embryo production (stimulation, culture, etc.) as well as quality of blastocysts varied between clinics. Briefly, expanded, non-collapsed blastocysts (D5 or D6) were vitrified by incubation at 23°C-26°C in I.C.E. vitrification media: V1-V3 media for 5min, 5min, and 1-2min; respectively. Blastocysts were loaded into the device of choice and stored in liquid nitrogen. Embryos were warmed and rehydrated by sequential dilution in thaw media (T1-T5). Clinics used a variety of storage devices ranging from micro-volume (micro-secure and HSV) to large volume (0.25cc straw).

Results:

Table 1: Pregnancy results from fresh and vitrified blastocysts in 8 IVF clinics

Age	Survival	Transfers	Clin. Preg Rate	Fresh Preg Rate
<35	745/819 (91.0%)	501	246/501 (49.1%)	187/337 (55.5%)
35-37	287/312 (92.0%)	189	98/189 (51.8%)	76/140 (54.3%)
38-40	196/215 (91.2%)	110	57/110 (51.8%)	32/78 (41.0%)
41-42	39/45 (86.7%)	23	6/23 (26.1%)	9/44 (20.4%)
43+	12/12 (100%)	9	4/9 (44.4%)	1/4 (25%)
Donor	112/121 (92.6%)	59	35/61 (57.4%)	102/178 (57.3%)

Blastocyst survival was 91.3% for all age groups combined. Clinical pregnancy rates were similar between fresh and vitrified blastocysts, except for patients ages 38-40, where the rate was higher ($p<0.05$) in the vitrified group.

Conclusions:

The collective data demonstrate the effectiveness of vitrification using a simple, closed, system in a variety of clinical settings, despite all of the variations between patient demographics, stimulation protocols, and embryo culture. I.C.E. vitrification represents an alternative approach to traditional DMSO systems and can be successfully utilized with a variety of storage devices.

Support: None.