Re-expanding for success: the impact of blastocyst expansion on pregnancy rates after rapid thawing

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Introduction

Blastocyst expansion is an indicator that the blastocyst is capable of properly expressing the cellular functions necessary for implantation in the endometrium. If a blastocyst recovers quickly from thawing and reaches an adequate level of expansion, this may increase the likelihood of successful implantation. Blastocysts that re-expand and increase their degree of expansion after rapid thawing tend to have a higher implantation potential compared to those that do not re-expand or only expand partially.

Objectives

This is a cohort study addressing the pregnancy rates in relation to blastocyst expansion rate during post-thaw culture before embryo transfer. From September 2024 to December 2024, 335 embryo transfer cycles were performed at the SS PMA of Fondazione IRCCS Cà Granda Ospedale Maggiore Policlinico di Milano, involving a total of 337 thawed blastocysts with rapid warming protocol. The expansion grade was assessed at freezing and after two hours of culture in CSCN NX complete medium from thawing.

Results

A total of 337 rapid thawed blastocysts were analyzed. The median age at thawing was 37 (34–40). The freezing day was D5 (156, 46%), D6 (142, 42%), and D7 (39, 12%). Two blastocysts did not survive thawing, and 8 patients were lost to follow-up. A total of 327 blastocysts were analyzed: 246 non-re-expanded (69 pregnancies, 28%) vs 81 that re-expanded (39 pregnancies, 48%), p=0.001. When selecting only blastocysts with an expansion grade of 3 and 4 at thawing (according to the Istanbul Consensus ESHRE, 2011), a total of 274 were analyzed: 205 non-re-expanded (58 pregnancies, 28%) vs. 69 that re-expanded (31pregnancies, 45%), p=0.017.

Conclusions

Blastocysts that showed an increase in expansion grade at rapid thawing demonstrated a higher pregnancy rate compared to those that did not re-expand. We also compared only grade 3 and 4 expanded blastocysts vs. non-re-expanded, and again, the pregnancy rate was higher in embryo transfer cycles where the blastocyst re-expanded.

Recommended reading

- *Liebermann J, Hrvojevic K, Hirshfeld-Cytron J, et al. Fast and furious: pregnancy outcome with one-step rehydration in the warming protocol for human blastocysts. Reprod Biomed Online. 2024;48(4):103731.*
- *Manns JN, Katz S, Whelan J III, et al. Validation of a new, ultra-fast blastocyst warming technique reduces warming times to 1 min and yields similar survival and re-expansion compared to blastocysts warmed using a standard method. Fertil Steril. 2021;116(3): e165.*
- *Taylor TH, Manns JN, Katz I, et al. Ultrafast warming protocol demonstrates similar outcomes & significantly decreases embryology workload compared to standard warming protocols, a randomized control trial with euploid blastocysts. Fertil Steril. 2022;118(4): e150.*