CLINIAL IMPACT OF TRANSFERRING A COLLAPSED BLASTOCYST AT TIME OF FROZEN EMBRYO TRANSFER: A RETROSPECTIVE STUDY

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Introduction

Embryo viability is critical for successful pregnancy. Embryos spontaneously or are artificially collapsed during vitrification. Re-expansion after warming is viewed as a measure of embryo health and seen as a predictor of clinical pregnancy outcome. Patients are anxious when provided with a developmental report of a collapsed blastocyst for frozen embryo transfer (FET). However, there is not accurate data on the chance of success after transferring a collapsed blastocyst.

Objective

The aim of this retrospective study was to evaluate the effect of blastocyst re-expansion on predicting pregnancy outcomes during a FET cycle.

Materials and Methods

Patients who underwent a FET between January 2015 and December 2022 in our centre were included. Patients were age-matched in a 1:2 ratio and blindly randomized by embryo quality at time of vitrification and divided into two groups, collapsed (n=155) and expanded (n=311) for comparison. Groups were further stratified into good (≥3BB) or low (<3BB) embryo quality using Gardner's blastocyst scoring system and age (< 38 vs.≥ 38) prior to vitrification. The primary outcome was clinical pregnancy rate (CPR). Chi-square tests of independence were performed to examine the association between pregnancy outcome(s) and collapsed versus expanded blastocysts, pregnancy outcome and embryo quality, and pregnancy outcome and age. Cramer's V was used to determine effect size for each chi-square test. Odd's ratios with 95% confidence intervals were reported.

Results

A total of 466 single FET cycles were analyzed in this study. Overall 7.1% of patients had a collapsed blastocyst transferred at the time of FET. The mean age, BMI, number of stimulation days, endometrial thickness, parity, and stimulation protocol was not statistically significant between the groups. From our matched comparison, there was a significant association between pregnancy outcome and collapsed versus expanded blastocysts, χ^2 (1, N = 466) = 9.901, p = 0.002, with a small effect size, V = 0.141. Positive pregnancy outcomes were more likely with expanded blastocysts (OR = 2.145, 95% CI [1.324, 3.473]). There was a significant association between pregnancy outcome and embryo quality, χ^2 (1, N = 496) = 5.743, p = 0.017, with a small effect size, V = 0.108. Positive pregnancy outcomes were more likely with good quality embryos (OR = 1.657, 95% CI [1.094, 2.510]). There was also a significant association between pregnancy outcome and age, χ^2 (1, N = 496) = 24.340, p=<0.001, with a small to medium effect size, V = 0.222. Positive pregnancy outcomes were more likely with the younger age category (<38 years of age) (OR = 4.908, 95% CI [2.478, 9.720]).

Conclusion

Our findings suggest that transfer of a collapsed blastocyst during FET is associated with a lower CPR. Not surprisingly, the implantation and clinical pregnancy rate was higher in the groups with higher quality embryos (≥ 3BB) and in the younger age group (<38 years ago). Despite these differences, clinically relevant pregnancies can be achieved after the transfer of a collapsed blastocyst especially in the younger population.

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