American Society for Reproductive Medicine 2020 Virtual Congress

October 17-21, 2020

DEVELOPING A DECISION SUPPORT TOOL TO DETERMINE OPTIMAL NUMBER OF EUPLOID EMBRYOS BANKED TO ACHIEVE A DESIRED FAMILY SIZE

Devora Aharon, MD[1], Cory Weinfeld, MS[2], Alan B Copperman, MD[1] and Erkan Buyuk, MD[1]

1. Obstetrics, Gynecology and Reproductive Science, Icahn School of Medicine at Mount Sinai, Klingenstein Pavilion 1176 Fifth Avenue 9th Floor New York, New York, United States, 10029.
2. Reproductive Medicine Associates of New York, 635 Madison Ave 10th Floor New York, New York, United States, 10022

OBJECTIVE: As women get older, the likelihood for pregnancy decreases: the chance of live birth (LB) after one IVF cycle at the age of 40 is 23%, but it declines to 4% at the age of 43, an 83% decrease.[1] This poses a challenge in particular for women above 35 who desire more than one child. After delivery of the first baby, the chance for pregnancy through a new IVF cycle will most likely be decreased. Ideally, women would bank the total number of euploid embryos needed to complete their family at a younger age. It is currently unknown how many euploid embryos need to be frozen for patients to achieve their ideal number of children. The aim of this study is to develop a decision support tool to inform patients about the number of euploid embryos that would result in a high likelihood of achieving their desired family size.

STUDY DESIGN: Retrospective cohort study

MATERIALS AND METHODS: All patients who underwent single euploid frozen-thawed embryo transfer (FET) from January 2013 through October 2019 were included. The probabilities of one and 2 LB according to cumulative number of single euploid FET performed were calculated. Data were stratified by SART age group. Events of monozygotic splitting that resulted in twin LB were counted as 2 LB.

RESULTS: 4,169 single euploid FET cycles were included in the study. Overall, 69% of patients who attempted for one baby achieved a LB, and 67% of patients who attempted for two children achieved two LB. 78.8% of patients who transferred 2 euploid embryos achieved 1 LB and 13.1% achieved 2 LB (Table 1). The likelihood of 1 LB and 2 LB increased to 92.5% and 39.7% after 3 FETs, and to 97.9% and 71.7% after 4 FETs, respectively.

CONCLUSIONS: The goal of achieving two live births increased by 81% when 4 embryos were transferred compared to 3, indicating that patients who desire two children would be advised to bank at least 4-5 euploid embryos. Patient-focused decision support tools are now possible due to big data; a calculator will be built incorporating patient-specific factors to determine how many euploid embryos patients should bank in order to achieve their desired family size.

Table 1. Likelihood of achieving 1 or 2 live births according to number of euploid single frozen-thawed embryo transfers performed

SART group	A (<35)		B (35-37)		C (38-40)		D (41-42)		E (>42)		All patients	
Euploid SET #	1 live birth	2 live births	1 live birth	2 live births	1 live birth	2 live births	1 live birth	2 live births	1 live birth	2 live births	1 live birth	2 live births
1	52.1%	0.7%	49.9%	0.9%	50.4%	0.7%	48.4%	0.8%	49.4%	1.5%	50.6%	0.8%
2	80.8%	11.2%	78.4%	12.7%	77.5%	15.7%	76.0%	14.3%	75.9%	13.3%	78.8%	13.1%
3	93.8%	36.1%	93.2%	44.7%	91.2%	40.4%	92.0%	42.5%	87.2%	30.9%	92.5%	39.7%
4	98.6%	75.0%	97.9%	74.1%	97.6%	71.0%	97.1%	67.8%	96.7%	60.0%	97.9%	71.7%
5	99.5%	91.5%	99.5%	93.0%		88.9%	99.1%	84.3%	97.8%	81.8%	99.2%	89.6%
6		97.3%	99.9%	98.2%			100%	91.8%	99.4%	90.3%	99.8%	96.6%
7			99.9%	99.1%							99.9%	98.9%
8			99.9%	99.1%							99.9%	99.2%
9			100%	100%							100%	100%