Title

AGE REMAINS THE MAIN PREDICTOR OF ACHIEVING A EUPLOID EMBRYO FROM AN IVF CYCLE

Authors

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Objective

Transfer of a single euploid embryo results in high implantation and low miscarriage rates. This strategy also decreases the risk of multiple gestation and its associated comorbidities. In some cycles no single euploid embryo is available for transfer. This study aimed to identify factors associated with achieving the development of at least one euploid embryo.

Design

Retrospective cohort study

Materials and Methods

Patients who underwent IVF cycle(s) between 2012 and 2017 were included. Oocyte donation cycles were excluded from analysis. Trophectoderm biopsy and pre-implantation genetic testing (PGT) were performed on all embryos. Patient age, BMI, ovarian reserve testing, peak serum estradiol (E2) and progesterone (P4) concentrations, number of oocytes retrieved, number of 2PN, cleavage stage and blastocyst embryos, and number of embryos biopsied were recorded.

Data were analyzed using a student's t-test and binary logistic regression model with SAS software. P value < 0.05 was considered statistically significant.

Results

A total of 2,452 IVF cycles were performed, of which 1859 resulted in a euploid embryo and 593 resulted in no embryos suitable for transfer. Patients who achieved a euploid embryo were significantly younger (36.1 ± 3.94 vs. 39.8 ± 3.53 years, p<0.001), had a lower FSH (6.25 ± 3.02 vs. 7.06 ± 3.66, p <0.001), higher AMH (3.64 ± 4.21 vs. 1.95 ± 3.31, p<0.001) and higher antral follicle count (12.8 ± 6.54 vs. 8.62 ± 4.68, p<0.001) than those who had no euploid embryos available for transfer. For every additional year of age, there was an 18% decrease in having a euploid embryo (OR 0.82, 95% CI 0.78-0.86). There was a significant difference in the number of embryos available for biopsy between the groups [Table 1]. The chance of having a euploid embryo was increased almost two-fold for every additional embryo that developed to blastocyst stage (OR 1.68, 95% CI 1.45-1.95).

Conclusions

PGT provides precise genomic information that allows us to better counsel patients. The study demonstrated that for every additional year of age there is an 18% decreased likelihood of creating at least one euploid embryo per cycle. Maternal age is a better predictor than serum markers of ovarian reserve for obtaining at least one euploid embryo Support

None.

Table 1

	Euploid Embryo Achieved (n=1859)	No Euploid Embryos Achieved (n=593)	P Value
Age (y)	36.1 ± 3.94	39.8 ± 3.52	<0.001
BMI (kg/m^2)	23.5 ± 4.26	23.9 ± 4.38	NS
Day 3 FSH (IU/mL)	6.25 ± 3.02	7.06 ± 3.66	<0.001
Anti-mullerian Hormone (pmol/L)	3.64 ± 4.21	1.95 ± 3.31	<0.001
Basal Antral Follicle Count	12.8 ± 6.54	8.62 ± 4.68	<0.001
Peak E2 (pg/mL)	2338 ± 1144	1757 ± 1002	<0.001
Peak P4 (ng/mL)	0.91 ± 0.57	0.84 ± 0.55	0.02
No. of Oocytes Retrieved	16.3 ± 9.56	9.99 ± 6.28	<0.001
No. of mature oocytes	0.99 ± 0.07	0.99 ± 0.10	NS
No. 2PN	10.5 ± 6.70	5.61 ± 4.16	<0.001
No. Day 3 embryos	10.1 ± 6.47	5.38 ± 4.04	<0.001
No. Blastocysts on Day 5	7.19 ± 5.23	3.10 ± 2.91	<0.001

No. Blastocysts for biopsy	5.71 ± 4.12	2.22 ± 2.02	<0.001
Tested for Single Gene Disorder	0.06 ± 0.23	0.04 ± 0.18	0.02