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Title:

PREIMPLANTATION GENETIC TESTING Of EMBRYOS IN DONOR EGG CYCLES IS ASSOCIATED WITH A DECREASE IN THE NUMBER OF EMBRYOS TRANSFERRED AND AN IMPROVED IMPLANTATION RATE

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Background:
Aneuploidy is more common in embryos derived from advanced maternal age (AMA) oocytes. Trophectoderm biopsy with comprehensive chromosomal screening (CCS) improves implantation and pregnancy rates and decreases pregnancy loss. Older women with diminished ovarian reserve may opt to use donated oocytes to overcome their age-related infertility. A growing minority of these patients elect to have their embryos analyzed by CCS prior to embryo transfer.

Objective:
To assess whether preimplantation genetic screening (PGS) is beneficial in oocyte recipients (OR).

Materials and Methods:
A retrospective chart review identified 954 donor OR cycles from December 2011 to August 2015. Thirty eight patients underwent 45 OR cycles with PGS, using PCR based technology. Patient demographics and IVF cycle characteristics and outcomes were compared with that of ORs who did not have PGS (n=909). Both groups were substratified by whether a fresh or frozen embryo transfer was performed. Student's T-test, chi-square and Fisher's exact test were used where appropriate.

Results:
Patient demographics and clinical outcomes after fresh and frozen embryo transfer are shown in Tables 1 and 2. Recipient and oocyte age were similar between PGS and non-PGS groups. ORs

undergoing PGS had 206 (8.2 ± 4.8 per patient) blastocysts biopsied, of which 78.2% (6.4 ± 3.7 per patient) were euploid. PGS was done for CCS only in 68.9% (n=31) of cases and for sex selection in 31.3% (n=14). Of the cases done exclusively for CCS, 1 was indicated for a known genetic risk factor: male partner with 45X/47XYY mosaicism. In both fresh and frozen embryo transfer cohorts, non-PGS ORs had a significantly greater number of embryos transferred. Implantation and clinical pregnancy rates were significantly increased in the PGS group in both fresh and frozen embryo cohorts. There was a trend toward lower rates of early pregnancy loss and multiple gestation in the PGS groups, however this was not statistically significant.

Table 1: Oocyte recipient demographics and clinical outcomes after fresh embryo transfer

	PGS	Non-PGS	P-value
No. patients	25	619	
Recipient age	43.4 ± 4.0	42.4 ± 4.8	NS
Oocyte donor age	26.9 ± 3.7	26.7 ± 3.4	NS
Blastocysts transferred	1.3 ± 0.5 (32)	1.8 ± 0.6 (1139)	<0.05
Implantation rate*	71.9% (23/32)	52.6% (599/1139)	<0.05
Clinical pregnancy rate*	71.9% (23/32)	48.7% (555/1139)	<0.05
Early pregnancy loss rate*	12.0% (3/25)	17.4% (108/619)	NS
Multiple pregnancy rate*	12.0% (3/25)	27.0% (167/619)	NS

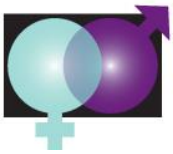
Table 2: Oocyte recipient demographics and clinical outcomes after frozen embryo transfer

	PGS	Non-PGS	P-value
No. patients	20	290	
Recipient age	44.2 ± 3.3	43.7 ± 4.0	NS
Oocyte donor age	28.7 ± 5.6	26.5 ± 3.3	NS
Blastocysts transferred	1.1 ± 0.2 (21)	1.6 ± 0.6 (453)	<0.05
Implantation rate*	70.0% (14/21)	40.0% (181/453)	<0.05
Clinical pregnancy rate*	60.0% (12/21)	36.4% (165/453)	0.05
Early pregnancy loss rate*	10.0% (2/20)	22.8% (66/290)	NS
Multiple pregnancy rate*	5.0% (1/20)	12.1% (35/290)	NS

Values are expressed as mean ± standard deviation, totals in parentheses, and frequencies as percentages*.

Conclusions:

Even among young donors, the incidence of embryo aneuploidy can be clinically significant. Given that current technology allows for accurate determination of chromosomal competence, ovum recipients are now considering CCS prior to embryo transfer. In addition, multiple gestation is known to be a major driver of maternal and neonatal morbidity. In older recipients, there is a growing movement towards elective single embryo transfer (eSET). We have



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demonstrated that by screening embryos, we can confidently increase pregnancy rates, and recommend eSET to eliminate multiple gestations.