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Title:

THE LIKELIHOOD OF IMPLANTATION FOLLOWING TRANSFER OF A EUPLOID EMBRYO IS NOT CORRELATED WITH SELF-REPORTED RACE

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Objective:

Data are conflicting regarding the impact of a patient's race on assisted reproductive technology treatment success. A study published by Dhillon et al. observed lower IVF pregnancy rates in African American (AA) and Asian women as compared to Caucasian women; however, these findings were limited to cycles involving transfer of fresh, unscreened embryos. The current study sought to determine differences in pregnancy outcomes in women of different racial groups who undergo a single, euploid frozen embryo transfer (FET).

Design:

Retrospective cohort study at a single, urban reproductive medicine practice

Materials and Methods:

The study included patients who underwent IVF cycle(s) followed by a single, euploid FET between 2015 and 2017. Oocyte donation cycles were excluded from analyses. Trophectoderm biopsy and pre-implantation genetic testing for aneuploidy (PGT-A) were performed on all embryos. Patient age, body mass index (BMI), self-reported race, endometrial type and thickness at time of transfer, blastocyst morphologic grade and day of embryo biopsy were recorded.

Clinical pregnancy (CP) was confirmed by the presence of an intrauterine gestational sac on ultrasound. Ongoing pregnancy/live birth (OP/LB) rate, early pregnancy loss (EPL) rate, and clinical pregnancy loss (CPL) rate were determined. Patients were separated into groups based on race: AA, Asian, and Caucasian. Data were analyzed using a Student's t-test, Chi square/Fisher's Exact test, Cochrane Armitage trend test, and binary logistic regression.

Results:

A total of 812 patients underwent 1,111 single, euploid FETs. Compared to all other study groups, patients of AA (n=51) descent were significantly older (38.0 ± 3.1 yrs, p 0.0006), had a higher BMI (27.0 ± 4.2, $p < 0.0001$) and were more likely to have a TE grade of A (53.1%, p=0.02). Asian (n=237) patients were more likely to be nulliparous (84.9%, p=0.03) compared to Caucasian women. All other cycle characteristics were similar among racial groups, including endometrial thickness and type, day of embryo biopsy and blastocyst morphologic grade (Table 1). There were no significant differences in CP (p=0.67), OP/LB (p=0.51), EPL (p=0.73), or CPL (p=0.12) rates among ethnicities, before and after adjusting for observed confounders (Table 2).

Conclusions:

Successful IVF outcomes following the transfer of a single, euploid embryo do not appear to differ among women of different races. Despite differences in age, BMI and parity observed among women of different races in this study, these dissimilarities did not contribute to pregnancy outcomes. Utilization of a combined PGT-A and FET protocol in a high quality laboratory results in universally high pregnancy rates and low miscarriage rates, regardless of patient race.

Support:

None.

References:

1. Dhillon R. et al., "Investigating the effect of ethnicity on IVF outcome." RBMO, 2015 (31): 356-363.

Table 1:

Baseline Characteristics and Demographics among Patients of Different Ethnicities

	African American (n=51)	Asian (n=237)	Caucasian (n=823)	P Value
Age (y)	38.0 ± 3.1*‡	36.2 ± 3.6‡	35.9 ± 3.9*	0.0006
BMI (kg/m^2)	27.0 ± 4.2*	23.0 ± 3.8*	23.7 ± 4.3*	<0.0001
Nulligravid	24 (48%)	117 (50.7%)	406 (49.3%)	0.40
Nulliparous	38 (76%)	196* (84.9%)	607* (73.8%)	0.03
Endometrial Thickness at time of Transfer (mm)	9.7 ± 2.1	9.5 ± 1.8	9.6 ± 1.9	0.80
Endometrial Type 2 at time of transfer	11 (21.6%)	39 (16.7%)	155 (18.8%)	0.60
Embryo biopsy on Day 5	37 (72.6%)	163 (68.8%)	579 (70.4%)	0.60
Embryo Expansion Grade 4	23 (45.1%)	98 (41.4%)	323 (39.2%)	0.58
Embryo Inner Cell Mass Grade A	33 (67.4%)	146 (63.5%)	555 (67.4%)	0.09
Embryo Trophectoderm Grade A	26* (53.1%)	67* (29.1%)	289* (35.1%)	0.02

Table 2: Pregnancy Outcomes based on Ethnicity

	Clinical Pregnancy	No Clinical Pregnancy	P Value	Adjusted Odds Ratio (95% CI)		Ongoing Pregnancy/ Live Birth (OP/LB)	No OP/LB	P Value	Adjusted Odds Ratio (95% CI)
African American (n=51)	28 (54.9%)	23 (45.1%)		0.74 (0.4-1.3)		25 (49.0%)	26 (51.0%)		0.80 (0.5-1.4)
Asian (n=237)	150 (63.3%)	87 (36.7%)	0.79	1.1 (0.8-1.4)		126 (53.2%)	111 (46.8%)	0.51	0.95 (0.7-1.2)
Caucasian (n=823)	511 (62.1%)	312 (37.9%)		Ref		448 (54.4%)	375 (45.6%)		Ref

	Early Pregnancy Loss	No Early Pregnancy Loss	P Value	Adjusted Odds Ratio (95% CI)		Clinical Pregnancy Loss	No CPL	P Value	Adjusted Odds Ratio (95% CI)
African American (n=51)	7 (13.7%)	28 (80.0%)		1.2 (0.5-2.8)		3 (8.6%)	32 (91.4%)		0.83 (0.2-2.8)
Asian (n=237)	31 (13.1%)	150 (82.9%)	0.99	1.0 (0.6-1.5)		24 (13.4%)	157 (86.7%)	0.25	1.3 (0.8-2.2)
Caucasian (n=823)	107 (13.0%)	511 (62.1%)		Ref		63 (12.3%)	555 (87.7%)		Ref

Alternate table:

	African American (n=51)	Asian (n=237)	Caucasian (n=823)	P Value
Clinical Pregnancy Rate	28 (54.9%)	150 (63.3%)	511 (62.0%)	0.53
Ongoing Pregnancy/Live Birth Rate	25 (49.0%)	126 (53.2%)	448 (54.4%)	0.73
Early Pregnancy Loss Rate	7 (13.7%)	31 (13.1%)	107 (13.0%)	0.92
Clinical Pregnancy Loss Rate	3 (8.6%)	24 (13.4%)	63 (12.3%)	0.48