TROPHECTODERM BIOPSY FOR PREIMPLENTATIOM GENETIC TESTING (PGT) IN WOMEN UNDERGOING IVF IS NOT ASSOCIATED WITH MATERNAL COMPLICATIONS OF ABNORMAL PLACENTATION

Authors: Stovezky Yael R (1), Saleh Farrah (2), Beroukim Gabriela (2), Scholl Jessica E (3), Steven D Spandorfer (2)

Affiliations: (1) Lenox Hill Hospital, Northwell Health, New York, NY, USA; (2) The Ronald O. Perelman and Claudia Cohen Center for Reproductive Medicine, Weill Cornell Medical Center, New York, NY, USA; and (3) Weill Cornell Medicine, New York, NY, USA

Background
Preimplantation Genetic Testing (PGT) has gained tremendous popularity as a method of prioritizing embryos for transfer in IVF cycles in the United States. The most contemporary application of PGT utilizes trophectoderm biopsy whereby cells are removed from the placental precursor. Consequently, a risk of adverse obstetric complications associated with aberrant placentation has been theorized. Few studies have investigated the relationship between PGT and late-pregnancy maternal and perinatal complications producing conflicting results (1-4). More research in this area could ultimately lead to a more selective use of PGT, reducing the monetary burden and circumventing potential risks associated with the biopsy procedure.

Objective
The purpose of this study was to evaluate the association between PGT and obstetric complications of abnormal placentation in a cohort of women undergoing their first IVF cycle.

Materials and Methods
Women who underwent their first frozen–thawed embryo transfer (FET) resulting in a singleton live birth beyond 24 weeks in an academic hospital setting between 10/2020 and 12/2021 were included. Women were stratified into two study groups based on PGT status: “Biopsied” and “Not Biopsied”. The primary outcomes were non-severe cases of hypertensive disorders of pregnancy (HDP) (gestational hypertension, pre-eclampsia without severe features), severe cases of HDP (pre-eclampsia with severe features, eclampsia), gestational diabetes, intrauterine growth restriction (IUGR), postpartum hemorrhage, placenta previa, and low-lying placenta. Logistic regressions were used in the analyses. All regressions were adjusted a priori for female age, BMI, smoking status, parity, and history of diabetes and chronic hypertension.

Results
360 women were included (“Biopsied”: n=259; Not Biopsied”: n=101). Regression models did not reveal a relationship between trophectoderm biopsy and non-severe HDP, gestational diabetes, IUGR, postpartum hemorrhage, placenta previa, and low-lying placenta. The rate of severe cases of HDP was higher in the Biopsied group compared to the Not Biopsied group (6.1% vs. 3.0%). However, after adjusting for confounders, the relationship was found to be insignificant (Table 1).

Conclusions
In our population of women undergoing IVF with a singleton live birth following single embryo transfer trophectoderm biopsy for PGT does not appear to predict adverse obstetric outcomes.

Support
None

References
1. Forman, E.J., Hong, K.H., Franasiak, J.M. and Scott Jr, R.T., 2014. Obstetrical and neonatal outcomes from the BEST Trial: single embryo transfer with aneuploidy screening improves outcomes after in vitro fertilization without compromising delivery rates. American journal of obstetrics and gynecology, 210(2), pp.157-e1.
2. Jing, S., Luo, K., He, H., Lu, C., Zhang, S., Tan, Y., Gong, F., Lu, G. and Lin, G., 2016. Obstetric and neonatal outcomes in blastocyst-stage biopsy with frozen embryo transfer and

cleavage-stage biopsy with fresh embryo transfer after preimplantation genetic diagnosis/screening. Fertility and Sterility, 106(1), pp.105-112.
3. Bay, B., Ingerslev, H.J., Lemmen, J.G., Degn, B., Rasmussen, I.A. and Kesmodel, U.S., 2016. Preimplantation genetic diagnosis: a national multicenter obstetric and neonatal follow-up study. Fertility and Sterility, 106(6), pp.1363-1369.
4. Zhang, W.Y., von Versen-Höynck, F., Kapphahn, K.I., Fleischmann, R.R., Zhao, Q. and Baker, V.L., 2019. Maternal and neonatal outcomes associated with trophectoderm biopsy. Fertility and sterility, 112(2), pp.283-290.

Table 1: Obstetric complications in FET pregnancies with and without trophectoderm biopsy

	Not Biopsied (n=101)	**Biopsied** (n=259)	**OR (95% Confidence Interval)**
Non-severe cases of HDP	6 (5.9)	16 (6.1)	1.0 (0.3-2.6)
Severe cases of HDP	3 (3.0)	16 (6.1)	1.9 (0.5-7.1)
Postpartum hemorrhage	8 (8.0)	15 (5.8)	0.77 (0.3-2)
Gestational diabetes	13 (12.8)	26 (10.0)	0.7 (0.3-1.5)
IUGR	2 (0.2)	1 (0.4)	0.1 (0.009-1.6)
Placenta disorder - Previa - Low lying	 2 (2.0) 3 (3.0)	 8 (3.0) 9 (3.4)	 1.2 (0.4-3.88) 1.3 (0.3-4.9)

FET, frozen–thawed embryo transfer; HDP, hypertensive disorders of pregnancy; IUGR, intrauterine growth restriction
Data are presented as (n, %)