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# INITIAL SERUM HUMAN CHORIONIC GONADOTROPIN LEVELS PREDICT LIVE BIRTH OUTCOMES FOLLOWING FROZEN EMBRYO TRANSFER WITH AND WITHOUT PREIMPLANTATION GENETIC TESTING FOR ANEUPLOIDY (PGT-A).

S. N. Dolitsky,a S. A. Neal,b M. Olcha,c K. Hong,d M. D. Werner,e S. Morin,f A. W. Tiegs,g L. Sun,h R. Scott.i aObstetrics and Gynecology, Robert Wood Johnson School of Medicine, New Brunswick, NJ; bIVI/RMA, Basking Ridge, NJ; cAlbert Einstein College of Medicine, Bronx, NY; dIVI-RMA of New Jersey, Morristown, NJ; eREI, IVI-RMA NJ, Basking Ridge, NJ; fReproductive Medicine Associates of New Jersey, Basking Ridge, NJ; gREI, RMANJ, South Orange, NJ; hFoundation for Embryonic Competence, Basking Ridge, NJ; iIVI RMA, Basking Ridge, NJ.

OBJECTIVE: Initial serum human chorionic gonadotropin (hCG) levels have an established association with IVF pregnancy outcomes1-3. However, many studies that have examined this association involved fresh transfers, transfer of multiple embryos, and embryos at varying stages of development. As contemporary practice patterns have shifted towards frozen transfer of a single blastocyst, evaluating the predictive value of initial hCG levels in this population is of interest. Additionally, it is not known if the predictive value of the initial hCG level is different for embryos that have undergone PGT-A. The objective of this study is to evaluate early serum human chorionic gonadotropin levels as a predictor of live birth following frozen embryo transfer (FET) of a single blastocyst with and without PGT-A.

DESIGN: Retrospective cohort study.

MATERIALS AND METHODS: All FETs of a single blastocyst at a large IVF center between 2010 and 2016 were reviewed for inclusion. Only those FET cycles resulting in a positive hCG nine days post-transfer were included in this analysis. Initial hCG levels were stratified and live birth rates were analyzed. Chi square analysis was used to compare live birth rates for each hCG category following transfer of embryos with and without PGT-A. RESULTS: A total of 5280 FET cycles were included and 3417 (64.7%) of those cycles resulted in live birth. The mean hCG for a pregnancy resulting in live birth was 185 (+101.4) versus 60.7 (+76.1) mIU/mL for a non-viable gestation (P<0.01). Table 1 displays the live birth rate following FETof embryos with and without PGT-A, stratified by hCG level 9 days post-transfer. Initial serum hCG levels < 50 mIU/mL were associated with reduced live birth rates. For initial hCG levels between 50 and 150 mIU/mL, the live birth rate was approximately 10% higher following transfer of a genetically screened embryo. Live Birth Rates Initial hCG (mIU/mL) Live birth rate with PGT-A (n¼3,592) Live bith rate with no PGT-A (n¼1,688) P-value 0.1-50 94/779 (12.1%) 48/510 (9.4%) 0.14 50.1-100 377/534 (70.6%) 163/269 (60.6%) <0.01 100.1-150 549/688 (79.8%) 199/283 (70.3%) <0.01 150.1-200 487/567 (85.9%) 207/244 (84.8%) 0.70 >200 947/1024 (92.5%) 346/382 (90.6%) 0.24

CONCLUSIONS: Even when initial serum hCG levels nine days after FET are low, there is still a chance of live birth. When the initial hCG level is between 50 and 150 mIU/mL, live birth rates are significantly higher with genetically screened embryos. References: 1. Urbancsek J, Hauzman E, Fedorcs_ak P, et al. Serum human chorionic gonadotropin measurements may predict pregnancy outcome and multiple gestation after in vitro fertilization. Fertil Steril 2002;78:540-2. 2. Oron G, Esh-Broder E, Weon-Young S, et al. Predictive value of maternal serum human chorionic gonadotropin levels in pregnancies achieved by in vitro fertilization with single cleavage and single blastocyst embryo transfers. Fertil Steril 2015;103:1526-31. 3. Shamonki MI, Frattarelli JL, Bergh PA, et al. Logarithmic curves depicting initial level and rise of serum beta human chorionic gonadotropin and live delivery outcomes with in vitro fertilization: An analysis of 6021 pregnancies. Fertil Steril 2009;91:1760-4. 