American Society for Reproductive Medicine 2019 Scientific Congress & Expo
October 12 to 16, 2019 ● Philadelphia, PA, USA

Title:

PREMATURE LUTEINIZATION IN THE ERA OF PGT-A: EMBRYONIC REPRODUCTIVE POTENTIAL IS NOT AFFECTED BY ELEVATED PROGESTERONE LEVELS DURING OVARIAN HYPERSTIMULATION

Authors:

Carlos Hernandez-Nieto, MD[1], Joseph A. Lee, BA[1], Tamar Alkon, MD[1], Martha Luna-Rojas, MD1, Jeffrey Klein, MD[1], Alan B Copperman, MD[1,2] and Benjamin Sandler, MD[1,2]

Affiliations:

1. Reproductive Medicine Associates of New York, 635 Madison Ave 10th Floor New York, New York, United States, 10022

2. Icahn School of Medicine at Mount Sinai, Klingenstein Pavilion 1176 Fifth Avenue 9th Floor New York, New York, United States, 10029

Objective:

Premature luteinization or early elevation in progesterone (P4) levels is often observed in patients who undergo a GnRH-antagonist protocol for controlled ovarian hyper stimulation (COH). High levels of P4 have been shown to impair endometrial receptivity which might decrease pregnancy rates. Additionally, an increased level of P4 has been theorized to be a marker for suboptimal embryo quality. This study aimed to evaluate the impact of premature luteinization during COH on rates of blastulation and embryo aneuploidy.

Design:

Retrospective cohort analysis

Materials and Methods:

The study included patients who underwent IVF stimulation from 2012-2019. Pre-implantation genetic testing for aneuploidy (PGT-A) were performed on blastocysts reaching criteria for TE biopsy, subsequently embryos were vitrified after biopsy. Cohorts were segregated in two groups: Group 1: blastocysts cryopreserved in the presence of normal P4 levels (P4 <1.5 ng/mL) the day of ovulation trigger; Group 2: blasts originated from oocytes retrieved after exposure to

premature luteinization (P4 ≥1.5 ng/mL) on the day of trigger. Demographic, COH parameters, blastulation, and euploidy rates were evaluated. IVF outcomes in a subsequent single euploid FET cycle were assessed. T-test, Xi2, and multivariate regressions with GEE models were used for data analysis. A sample size of 260 patients per group was calculated to create an 80% power to detect a difference of 10% on clinical pregnancy rates (CPR) (α=0.05).

Results:

A total of 3,659 patients with normal P4 (29,038 blasts) were compared to 331 patients with elevated P4 (3,327 blasts). Significant differences were found in BMI, AMH levels, Estradiol, and P4 levels on the day of hCG trigger and oocytes retrieved between cohorts. No difference was found in maturity rates (78.7%, 79.4%,p=0.1), fertilization rates(81.8%, 82.4%,p=0.2), cryopreserved blastocysts (76.5%, 75.5%,p=0.2), and aneuploidy rates (35.3%, 35%, p=0.7). Blastulation rate was higher in Group 1 (71.8%, 69.2%, p=0.0002). Furthermore, no differences were found in pregnancy (74.4%, 72.5%,p=0.4), clinical pregnancy (82.9%, 82.9%,p=0.5), ongoing pregnancy (70.5%, 68.7%,p=0.3) and clinical loss rates (9.7%, 14.1%,p=0.5) after an FET. After adjusting for age, BMI, AMH, and number of embryos biopsied per cycle, no association was found between elevated P4 levels and the odds of increased aneuploidy (OR=0.90, CI95% 0.7-1.03, p=0.15), blastulation rate (OR=0.90, CI95% 0.7-1.05, p=0.18), or number of good quality embryos (≥4BB) (OR=1.0, CI95% 0.8-1.22, p=0.92). Also, no association was found with elevated P4 levels and impaired CPR (OR=0.82, CI95%0.5-1.2, p=0.31) after adjusting for age, BMI, embryo quality, and endometrial thickness within our model.

Conclusion:

In an era of PGT-A/FET cycles, premature P4 elevation during IVF stimulation does not represent an obstacle to embryo implantation potential. Our study shows that premature luteinization occurring during COH is not associated with a negative effect on embryonic development, increased aneuploidy rates, or impaired IVF outcomes following subsequent FET.