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Cycle segmentation with elective freeze-all, as a strategy to provide a safe and effective approach in women with PCOS undergoing IVF

Nicholas Christoforidis
Embryolab IVF Unit, Greece

Polycystic ovarian syndrome is associated with a high risk of ovarian hyperstimulation syndrome (OHSS) in women seeking fertility treatment and undergoes assisted reproduction with IVF. OHSS is the single most serious complication of controlled ovarian stimulation with a wide range of manifestations, including life-threatening complications. The use of short protocols with gonadotropin releasing hormones (GnRH)-antagonists to achieve multiple follicular developments, has enabled the substitution of human chorionic gonadotropin (hCG) for final oocyte maturation with GnRH analogues, rendering the possibility of OHSS development extremely low. However, implantation rates in the same cycle following GnRH analogue trigger have not been satisfactory. In this context, the elective cryopreservation of embryos has been proposed as a safe means to avoid OHSS, at the same time, high implantation rates can be achieved with embryo transfer in a subsequent cycle, following endometrial preparation. The use of vitrification as a cryopreservation method of choice has been associated with extremely high post warming embryo survival rates. Our experience in Embryo lab Fertility Clinic is presented between 2012 and 2015, following the introduction of the "elective freeze-all strategy" as a means to provide a safe and effective IVF treatment in women with PCOS. Results suggest that moderate to severe OHSS can be eliminated, while embryo quality is not compromised following vitrification and warming of embryos for transfer. Clinical pregnancy rate appears at least as good as in fresh embryo transfers.

n.christoforidis@me.com

Does the gut microbiome play a role in the pathogenesis of PCOS?

Varykina G Thackray
University of California- San Diego School of Medicine, USA

Women with polycystic ovary syndrome (PCOS) have an increased risk of metabolic disease. Studies have shown that the human gut microbiome is altered in humans with obesity or type 2 diabetes and that changes in the gut microbiome may cause metabolic dysregulation. Although the Western diet has been proposed to contribute to the development of PCOS, it is unknown whether the gut microbiome is disturbed in women with PCOS. Since there is considerable variation in the human gut microbiome, we investigated whether the gut microbiome was altered in a PCOS mouse model using letrozole, a nonsteroidal aromatase inhibitor, to increase endogenous testosterone levels. Five weeks of letrozole treatment resulted in hallmarks of PCOS including elevated testosterone, acyclicity, polycystic ovaries and a metabolic phenotype. Using comprehensive lab animal monitoring system (CLAMS) metabolic cages, we demonstrated that food intake; respiration and energy expenditure were not changed, indicating that these factors are not responsible for the metabolic phenotype in the PCOS mouse model. Using 16S rRNA gene sequencing, we demonstrated changes in the gut microbiome of letrozole-treated mice including a substantial reduction in bacterial species and phylogenetic richness. In addition, letrozole treatment correlated with changes in the abundance of specific Bacteroidetes and Firmicutes bacteria implicated in other mouse models of metabolic disease. Understanding the role of the gut microbiome in PCOS may provide important insight into the pathogenesis of PCOS and lead to the development of novel treatment options for women with PCOS, including pre- or probiotic therapies.

vthackray@ucsd.edu