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CONCLUSIONS: AI did overcome experienced embryologists on overall pregnancy prediction of previously selected embryos. Embryologists were less likely to predict a negative outcome than the AI algorithm.

IMPACT STATEMENT: The new emerging technologies of artificial intelligence, mainly machine learning, are helpful tools to assist embryologists on embryo selection task and should be integrated to laboratory routine properly after in house validation.

O-198 12:00 PM Wednesday, October 26, 2022

COVID-19 VACCINATION AND ASSISTED REPRODUCTION OUTCOMES: A LITERATURE REVIEW AND META-ANALYSIS.

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OBJECTIVE: The COVID-19 pandemic remains a significant global health risk and poses an increased danger to pregnant mothers. There remains significant vaccination hesitancy amongst many in the population, in part due to unfounded claims regarding its effect on fertility (1). We conducted a literature review and meta-analysis comparing the available data on effects of COVID-19 vaccination on both ovarian stimulation and embryo transfer outcomes.

MATERIALS AND METHODS: A literature search of PubMed was conducted using the search terms COVID-19, SarsCov2, vaccines, bnt162 vaccines, 2019-ncov vaccine mrna-1273, in vitro fertilization, egg retrieval, oocyte retrieval and embryo transfer. Reported ovarian stimulation outcomes included number of oocytes retrieved, number of mature oocytes, number of fertilized oocytes, and number of blastocysts formed, and were compared using Student's t-test. Embryo transfer outcomes included implantation rate, clinical pregnancy rate, and ongoing pregnancy rate, and were compared using chi square. Meta-analysis was performed by Standard Mean Difference method for oocyte outcomes and the Cochran-Mantel-Haenszel method for embryo transfer outcomes.

RESULTS: Our search retrieved 12 studies conducted between August 2021 and March 2022. Of them, only 6 compared outcomes between COVID-19 vaccinated and unvaccinated patients. Two included only ovarian stimulation outcomes, two included only embryo transfer outcomes, and two studies included outcomes for both. Of the ovarian stimulation outcomes reported, data adequate for meta-analyses were only included for the number of oocytes retrieved and number of mature oocytes. There were no statistically significant differences reported between vaccinated and unvaccinated patients amongst the pooled data from the four studies for the ovarian stimulation parameter — number of oocytes retrieved (mean 10.6 vs 10.6, 95% CI -0.144 – 0.157), or the number of MII oocytes (mean 7.43 vs 7.95, 95% CI -0.055 – 0.247). There were similarly no statistically significant differences amongst the pooled data from the four studies for any of the embryo transfer parameters — implantation rate (OR 0.97, 95% CI 0.76 - 1.24), clinical pregnancy rate (OR 0.88, 95% CI 0.70 - 1.11), or ongoing pregnancy rate (OR 1.22, 95% CI 0.78 - 1.91).

CONCLUSIONS: The current literature demonstrates no differences in either ovarian stimulation or embryo transfer outcomes following COVID-19 vaccination. There remain several key parameters, however, that would benefit from additional investigation.

IMPACT STATEMENT: Patients can be reassured the current evidence reaffirms the safety profile of the mRNA COVID-19 vaccine and does not affect fertility.

References: 1. Hsu AL, Johnson T, Phillips L, Nelson TB. Sources of Vaccine Hesitancy: Pregnancy, Infertility, Minority Concerns, and General Skepticism. *Open forum infectious diseases* 2022;9:ofab433-ofab.

ORAL ABSTRACT SESSION: CRYOPRESERVATION

O-199 10:45 AM Wednesday, October 26, 2022

DOES TYPE OF TRIGGER INFLUENCE OOCYTE MATURITY IN PATIENTS UNDERGOING OOCYTE CRYOPRESERVATION, EMBRYO BANKING AND IN VITRO FERTILIZATION CYCLES USING LETROZOLE?

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OBJECTIVE: Letrozole is an aromatase inhibitor that is used during oocyte cryopreservation cycles to lower estradiol levels in patients with conditions such as breast cancer, lymphoma, seizures, BRCA mutation carriers and history of venous thromboembolic events (VTE). Many studies have determined that using letrozole has no effect on the number of oocytes retrieved or maturity. The purpose of this study is to determine if the type of trigger affected the percent of mature oocytes retrieved in patients undergoing controlled ovarian stimulation with letrozole.

MATERIALS AND METHODS: A retrospective chart review examined all oocyte cryopreservation, embryo banking, and IVF cycles that utilized letrozole at a single academic medical center between October 2019 and February 2022. Those who used recombinant hCG trigger were compared to those who received a dual trigger shot with GnRHa and hCG. Patients using GnRHa only were excluded. Trigger type was based on the discretion of the patient's provider using factors such as age, AMH, and risk for OHSS. The primary outcome of this study was oocyte maturity which was stratified based on trigger type. Oocyte maturity was calculated by dividing the number of Metaphase II oocytes (MIIs) by the total number of oocytes retrieved.

RESULTS: Of the 45 cycles, 20 cycles (44.4%) used a recombinant hCG trigger, 22 (48.9%) used a dual trigger with hCG and GnRHa. The dual trigger group had a statistically significantly higher AMH (3.43 vs 1.71 ng/ml, p<0.05), estradiol level on day of trigger (1050 vs. 571 pg/mL, p<.05), total number of oocytes retrieved (19.9 vs. 11.5, p<.05) and number of MIIs (14.6 vs. 7.3, p<.05). The mean oocyte maturity was not statistically different between groups (73.2% and 70.9%, p=.38).

CONCLUSIONS: Although there was a significant difference in estradiol levels on day of trigger, total number of oocytes retrieved, and total number of mature oocytes, there was no statistically significant difference in maturity rate. These results suggest that type of oocyte maturity trigger used during an oocyte cryopreservation cycle with letrozole should be based on a patient's individual risk factors for OHSS.

IMPACT STATEMENT: There is no difference in oocyte maturity rates in patient undergoing oocyte cryopreservation cycles using letrozole between dual trigger and hCG trigger alone.

O-200 11:00 AM Wednesday, October 26, 2022

VITRIFICATION WITH SLUSH NITROGEN DOES NOT IMPROVE REPRODUCTIVE POTENTIAL OF FROZEN EMBRYOS: A RANDOMIZED CONTROLLED TRIAL.

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OBJECTIVE: It is known that embryos incur some damage during vitrification leading to reduced reproductive potential. Vitrification with slush nitrogen (SN) provides a faster cooling rate compared to liquid nitrogen (LN), leading to decreased vitrification-induced toxicity as evidenced by improved survival after sequential freeze thaw cycles. It is unknown whether the benefits of SN remain clinically relevant with just one freeze thaw cycle. In this study we aimed to determine whether the use of SN for embryo vitrification can improve embryo transfer outcomes compared to the conventionally used LN.

MATERIALS AND METHODS: A double-blinded, randomized controlled trial was conducted at a university-affiliated infertility clinic between September 2020 and January 2022. Patients undergoing infertility treatment with IVF and PGT-A with a plan for subsequent frozen single embryo transfer (FET) were included in the study. Patients were block-randomized to vitrification with either SN or LN on the first day of blastulation. The primary outcome was sustained implantation rate (SIR) defined as the number of fetal heart beats at 9 weeks of gestation, per embryo transferred. Secondary outcomes included pregnancy rate, clinical pregnancy rate, and clinical miscarriage rate. A logistic regression was performed adjusting for patient age and FSH.

RESULTS: A total of 219 patients were randomized and underwent a subsequent FET. The two groups were similar with regards to baseline characteristics (Age, AMH, BMI, AFC). Embryology outcomes including number of oocytes retrieved, number of mature oocytes, fertilization rate, and total number of blastocysts biopsied were similar. There was no