Oxidative parameters in fertilization medium of cumulus – oocyte complex (COC) as measured by thermochemiluminescence (TCL) may predict treatment outcome in IVF: preliminary result…

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P-214 Tuesday, October 15, 2019 6:30 AM

THE PREVIOUS CESAREAN DELIVERY DOESN'T AFFECT THE PROGNOSIS OF IVF-ET: A LARGE SAMPLE RETROSPECTIVE CASE CONTROL STUDY. Shuo Yang, MD, Peking University Third Hospital, Beijing, China.

OBJECTIVE: To investigate whether the previous cesarean delivery would affect the treatment outcomes of multiparaties accepted IVF/ICSI-ET.

DESIGN: Retrospective case control study of one reproductive medical center, from 1st Jan. 2009 to 31st Dec. 2015. The main outcome measures were Clinical pregnancy rate (CPR) and Live birth rate (LBR). the study group (Group 1) were patients with previous cesarean section history, the control group (Group 2) were patients with history of vaginal delivery.

MATERIALS AND METHODS: This is a retrospective case control study, and data collection protocol was approved by the hospital ethics. All patients were multiparaties, the study group (Group 1) were patients with previous cesarean section history, the control group (Group 2) were patients with history of vaginal delivery. MatchIt package of R software was used for propensity score matching. The matching factors were age, number of oocytes retrieved and treatment time. According to 1:2 matching, the nearest neighbor matching method was used.

RESULTS: There were 461 cycles were included in the Group 1, and matched with 922 mutiparaties for the Group 2. The basic characteristics of patients refers to age, BMI, basal FSH and AFC were with no significantly difference. The initial dose of Gn was comparable between two groups, but the day of Gn injection was longer in control group and the total dose of Gn was higher too (11.3±2.4 vs. 11.9±2.7 $P<0.001$, 3328.5±1422.8 vs. 3595.9±1503.5, $P<0.05$, respectively). The number of oocytes peek-up, the rate of ICSI, MII oocyte and 2PN embryo were with no significantly difference. The cycle cancel rate was comparable between two groups. The number of embryos transferred were similar between two groups. The treatment outcomes refer to clinical pregnancy rate, implantation rate, early miscarriage rate, ectopic pregnancy rate and live birth rate. There was no uteral rupture or CS scar pregnancy in the study group.

CONCLUSIONS: The multiparaties with history of Cesarean section accepted IVF/ICSI treatment, got similar outcomes compared with those with history of vaginal delivery.

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OOCYTE DONOR IMPLANTATION AND PREGNANCY RATES PREDICT OOCYTE RECIPIENT PREGNANCY CHANCE IN AN EGG-SHARING DONATION PROGRAM. Daniela Paes de Almeida Ferreira Braga, PhD,[a] Amanda Souza Setti, MSc,[a] Matheus de Castro Azevedo, BSc,[b] Assumpto Iaconelli, Jr., MD,[a] Edson Borges, Jr., PhD.[a] [a]Fertility Medical Group / Sapientiae Institute, Sao Paulo, Brazil; [b]Fertility Medical Group, Sao Paulo, Brazil.

OBJECTIVE: Studying oocytes from the same cohort submitted to different situations may provide greater insight into possible predictors of pregnancy in recipient cycles, allowing continuous improvement in outcomes moving forward. The objective of this study was to investigate which are the predictive factors of successful pregnancy in oocyte recipient intracytoplasmic sperm injection (ICSI) cycles in an egg-sharing donation program.

DESIGN: Historical cohort study.

MATERIALS AND METHODS: This study was performed in a private university–affiliated IVF center. Analyzed data were obtained via chart review of 1505 vitrified oocytes donated to 225 oocyte recipients undergoing 307 ICSI cycles, participating in an egg-sharing donation program, between January/2015 and May/2017. For that sample size, computed achieved post-hoc power was 100%, considering pregnancy achievement as the main outcome measure. Oocyte donors were between the age of 19 and 34 years, and recipients were between the age of 26 and 50 years. Adjusted generalized linear models were used to investigate the impact of oocyte donors and recipients characteristics on recipients' pregnancy achievement. The results are expressed as exponentiation of regression coefficient (ExpB), 95% confidence interval (CI), and p-value. A receiver operating characteristic (ROC) curve was constructed to investigate the predictive value of oocyte donor implantation rate on oocyte recipient pregnancy achievement.

RESULTS: Implantation rate in oocyte donor was highly correlated with pregnancy achievement in oocyte recipient cycles (ExpB: 1.181, CI: 1.138 – 1.226, $p < 0.001$). The ROC curve analysis demonstrated that the implantation rate in oocyte donor has a strong predictive value on the achievement of pregnancy in oocyte recipient (area under the curve: 0.98, CI: 0.95 - 0.99, $p < 0.001$). The achievement of pregnancy in oocyte donors and recipients were highly associated (ExpB: 54.6, CI: 28.1 – 105.8, $p < 0.001$), irrespective of oocyte recipient age. Oocyte donor age, body mass index, number of follicles, retrieved oocytes, total dose of FSH administered and estradiol peak were not associated with oocyte recipient pregnancy achievement. In oocyte recipients, no association was found between the fertilization rate and the achievement of pregnancy, but the high-quality embryos rates on days 2 (ExpB: 3.397, CI: 1.635 – 7.054, p= 0.001) and 3 (ExpB: 6.629, CI: 1.185 – 37.092, p= 0.031), and blastocyst development rates (ExpB: 2.331, CI: 1.086 – 5.001, p= 0.030) were positively associated with pregnancy achievement.

CONCLUSIONS: Oocyte donor implantation rate and successful pregnancy, high-quality embryos rate, and blastocyst development rate predict pregnancy achievement in the oocyte recipient cycle. The strong association in pregnancy success between donors and recipients, and the lack of correlation between donor characteristics and cycles' outcomes, demonstrates the power of oocyte quality on the success of ICSI treatment.

Reference: NA.

SUPPORT: None.

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NATURAL VERSUS MANAGED NATURAL CYCLE PRIOR TO FET: A RANDOMIZED CONTROLLED TRIAL. Shari Mackens, MD,[a] Alexandre Marie Stubbe, MD,[a] Samuel Santos-Ribeiro, MD, PhD,[b] Arne van de Vijver, MD, PhD,[c] Herman Tournaye, MD, PhD,[a] Christophe Blockeel, MD, PhD.[a] [a]Universitair Ziekenhuis Brussel, Jette, Belgium; [b]IVI-RMA Lisbon, Lisbon, Portugal; [c]AZ Sint-Jan, Brugge, Belgium.

OBJECTIVE: To determine whether a NC-FET is superior to a managed NC-FET.

DESIGN: This randomized controlled trial (RCT) included patients transferring a cleavage stage vitrified/warmed embryo in a natural cycle between January 2014 and December 2018. Women were randomized to wait for spontaneous luteinizing hormone (LH) surge (=NC) or to trigger ovulation by a single injection of human chorionic gonadotropin (hCG) (=managed NC). None of the patients received additional luteal phase support. The primary outcome was ongoing pregnancy rate (OPR). Secondary outcomes included biochemical pregnancy rate, early pregnancy loss and the number of visits, blood samples and ultrasonographic exams prior to embryo transfer.

MATERIALS AND METHODS: A total of 260 subjects were randomized (130 per study arm), with 229 actually starting monitoring for the study-FET (117 allocated to spontaneous LH surge and 112 to hCG injection). Seven patients needed to be switched to a hormonal replacement treatment protocol due to the absence of follicular development, 12 had no embryo available for transfer after warming and 37 had a spontaneous LH surge before hCG injection although they were allocated to the induced ovulation group (following the study protocol stating hCG injection could be performed once endometrial thickness reached 7mm and the dominant follicle 17 mm).

RESULTS: The study groups did not significantly differ in baseline patient characteristics, nor in relevant variables of the fresh cycle generating the vitrified cleavage embryo(s). Regarding the study-FET, circulating serum estradiol and progesterone values were similar at monitoring start in both groups, as was the last measured endometrial thickness before embryo transfer and the rate of single versus double embryo transfer. Intention-to-treat (ITT), nor per protocol (PP) analysis revealed any statistically significant difference in OPR, biochemical pregnancy rate or early pregnancy loss of NC-FET in terms of whether ovulation was spontaneous or triggered. Respectively, the primary outcome parameter OPR was 27.4% vs 25.9% (p=0.80) for ITT and 29.1% vs 30.2% (p=0.88) for PP analysis. However, patients in the managed NC-FET group had significantly fewer visits to the clinic and blood samples performed than the NC-FET group (3.03 ±1.16 vs 4.05±1.40, $p<0.001$).

CONCLUSIONS: This RCT adds new high quality evidence to the existing controversial literature concerning the performance of NC-FET versus managed NC-FET. Based on our results showing equal clinical outcomes for both protocols, we propose to by default plan patients for managed NC-FET, as this is associated to one visit less for blood sampling and is thus more patient-friendly.

Reference: NA.

SUPPORT: NA.

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OXIDATIVE PARAMETERS IN FERTILIZATION MEDIUM OF CUMULUS - OOCYTE COMPLEX (COC) AS MEASURED BY THERMOCHEMILUMINESCENCE (TCL) MAY PREDICT TREATMENT OUTCOME IN IVF: PRELIMINARY RESULTS FROM A PROSPECTIVE STUDY. Zofnat Wiener- Megnazi, MD,[a] Hadar Gluska, MD,[b]

Shirly Lahav - Baratz, PhD,[c] Idit Blais, MSc.,[d] Sergei Shnizer, MD, PhD.,[e] Mara Koifman, MSc.,[f] David Ishai, MD,[g] Ido Feferkorn, MD,[h] Sivan Skvisky, MD,[h] Martha Dirnfeld, MD[i] [a]Head of Fertility and IVF Unit, Haifa, Israel; [b]Affiliation not provided; [c]Head of IVF lab., Haifa, Israel; [d]Carmel Medical Center, Haifa, Israel; [e]Carmel Diagnostics, Kiryat-Tivon, Israel; [f]Carmel Medical Centre IVF Lab, Haifa, Israel; [g]Senior consultant, Haifa, Israel; [h]Carmel medical center, Haifa, Israel; [i]Faculty of Medicine Technion, Haifa, Israel.

OBJECTIVE: To evaluate a possible association between oxidative parameters in COC medium as measured by Thermochemiluminesce (TCL) assay and outcome parameters in IVF.

DESIGN: A prospective cohort study.

MATERIALS AND METHODS: Sixty four women undergoing a fresh IVF cycle using conventional oocyte insemination during 2017-2019 participated in the study. COCs were incubated in a well containing 680 μl of culture media for approximately 4-6 hours. Immediately prior to addition of semen, 20 μl of COC culture medium were removed from each dish, examining for each sample 4 parameters: TCL amplitudes, after 50 seconds (TCLH1), 150 seconds (TCLH2), 250 seconds (TCLH3) and TCL ratio ((TCLH3-TCLH1)/100). TCL amplitudes were measured as counts per second (CPS).

RESULTS: We examined 97 COC fertilization media. Mean patients' age was 38 $\pm$4.7 years. Mean number of aspirated oocytes, COCs per well and number of wells per patient were 6.2$\pm$ 3.7, 4.6 $\pm$ 2.06 and 1.48 $\pm$ 0.5 respectively. Of 64 IVF cycles, in one cycle (1.5%) oocytes were not fertilized, in 8 cycles (12.7%) no embryos developed and in another 8 (12.7%) cycles, all embryos were frozen. Altogether fresh embryos were transferred in 46 cycles. Twenty one pregnancies were achieved (33.3% per started cycles, or 45.9% per embryo transfer cycle). In order to find an optimal cutoff that would distinguish between TCL values that were associated with higher chances of pregnancy, Youden index was used. A discriminatory TCLH2 value of $>$ 62.9 CPS was associated with higher chances for pregnancy (46.5% vs. 8.3%, OR=9.6, 95% CI(1.13-80.7) (p=0.03)). This value had a 95.2% sensitivity (95% CI=76.2-99.9), 32.4% specificity (95% CI=17.4-50.5), a positive predictive value of 46.5% (95% CI=31.2-62.3) and a negative predictive value of 91.7% (95% CI=61.5-99.8). No association was found between TCL parameters, regrading patient's age and number of aspirated oocytes. Multivariate analysis, correcting for age and number of aspirated oocytes, revealed that TCLH2 $>$62.9 was the only significant variable associated with the occurrence of pregnancy ($p<0.03$).

CONCLUSIONS: Oxidative parameters of COC medium may affect the likelihood of pregnancy. Measurement of oxidative parameters may serve as a potential aid in prediction of treatment outcome.

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IVF PREGNANCY RATES IN WOMEN UNDERGOING ACUPUNCTURE VS. CONTROLS. Phy L. Jennifer, DO,[a] Yan Zhang, PhD,[b] Jennie Orlando, MD,[b] Samuel D. Prien, PhD,[a] Lindsay L. Penrose, PhD,[a] Sheila Garos, PhD,[b] Jaou-Chen Huang, MD[c] [a]Texas Tech University Health Sciences Center, Lubbock, TX; [b]Affiliation not provided; [c]Texas Tech University Health Science Center - Lubbock, Lubbock, TX.

OBJECTIVE: To compare IVF pregnancy rates and early pregnancy outcomes in women receiving acupuncture treatment compared to controls.

DESIGN: Prospective randomized study.

MATERIALS AND METHODS: Women ages 21 to 42 years who were seeking *in-vitro* fertilization and embryo transfer (IVF-ET) were recruited for the study. Women were excluded if they were currently using alternative therapies such as acupuncture, herbal supplements or had a contraindication to needle insertion at the acupoints. Fifty participants were enrolled and were randomized by computer to either the treatment group or control group. Those assigned to the treatment group received three sessions of acupuncture during the IVF-ET process; the control group received standard IVF treatment. The three sessions of acupuncture occurred on days 6, 7 or 8 of gonadotropin stimulation, and approximately 1 hour prior to embryo transfer and within 48 hours after the embryo transfer. Acupuncture was performed by one certified clinician following a protocol adapted from a Delphi Consensus process developed specifically for patients undergoing IVF. Differences between the two groups (acupuncture vs control) were determined using Chi-square test for the variable, pregnancy status and Mantel-Haenszel Chi-square test for the variable, pregnancy outcomes which included singleton gestation, twin gestation or early pregnancy loss. A p of < 0.05 was considered statistically significant.

RESULTS: We found no statistically significant differences between the acupuncture and control groups for pregnancy status (χ^2= 0.16, p= 0.69) and pregnancy outcomes (χ^2=0.72, p= 0.53).

CONCLUSIONS: This study showed acupuncture based on Delphi Consensus Protocol at the above time points did not significantly affect the pregnancy rates in women undergoing IVF nor did it affect multiple birth or early pregnancy loss rates. Further studies with more subjects and/or more acupuncture sessions may be required to determine the impact of acupuncture on individuals receiving IVF treatment.

SUPPORT: Laura W. Bush Institute for Women's Health and University Medical Center.

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HIGH CONCORDANCE BETWEEN VAGINAL AND CERVICAL MICROBIOME ASSESSMENTS WITH INCREASING MICROBIAL DIVERSITY NEGATIVELY IMPACTS PREGNANCY OUTCOMES FOLLOWING TRANSFER OF A SINGLE EUPLOID BLASTOCYST. Shelby A. Neal, MD,[a] Xin Tao, Ph.D,[b] Li Sun, Ph.D,[b] Brent M. Hanson, MD,[a] Julia G. Kim, MD, MPH,[a] Emily K. Osman, MD,[a] Ashley W. Tiegs, MD,[a] Richard Thomas Scott, Jr., MD,[a] Jason M. Franasiak, MD.[a] [a]IVI-RMA New Jersey, Basking Ridge, NJ; [b]The Foundation for Embryonic Competence, Basking Ridge, NJ.

OBJECTIVE: To characterize the microbiome of the vagina and cervix in infertile patients undergoing in vitro fertilization (IVF) and evaluate with respect to pregnancy outcomes following single embryo transfer (SET) of a euploid blastocyst.

DESIGN: Prospective cohort study.

MATERIALS AND METHODS: All patients initiating an autologous IVF cycle with plans to utilize preimplantation genetic testing for aneuploidy (PGT-A) and undergo SET in a frozen embryo transfer (FET) cycle were eligible for inclusion. Patients with $>$ 1 prior failed IVF cycle and recent antibiotic use were excluded.

Ovarian stimulation, oocyte retrieval, intracytoplasmic sperm injection, extended culture, blastocyst biopsy for PGT-A, and vitrification were performed per routine protocol. Subjects with a euploid blastocyst underwent endometrial preparation for FET. Cervical and vaginal swabs were collected during the mid-proliferative phase and on day of transfer. Pregnancy outcomes were accrued.

Cervical and vaginal swabs underwent DNA isolation and next-generation sequencing of the V4 region of the bacteria-specific 16S ribosomal RNA gene using the Illumina NextSeq. The sequences were assigned to operational taxonomic units using the RDP classifier with confidence cutoffs of 0.8 in the QIIME package. All samples were assigned a Shannon diversity index (SDI) and categorized as $\geq$ 90% lactobacillus dominant (LBD) versus not (NLBD). Intra-patient correlation of cervical and vaginal specimens was assessed. Logistic regression was performed to account for age. The primary outcome of interest was ongoing pregnancy (presence of a fetal heartbeat at 8 weeks' gestation). $P<0.05$ was considered statistically significant.

RESULTS: Twenty-one subjects (mean age 35.1 $\pm$ 3.9, body mass index 29.2 $\pm$ 6.6, and antral follicle count 15.2 $\pm$ 7.3) consented to participation and underwent oocyte retrieval. Fifteen subjects (71.4%) made at least one euploid blastocyst. Cervical and vaginal specimens were highly correlated in the mid-proliferative phase and on day of transfer, with an intra-patient correlation of 0.93.

Of the 15 FETs, there were 9 ongoing pregnancies, 1 biochemical loss, and 5 negative pregnancy tests. Increasing species diversity of the vaginal microbiome on the day of FET, as reflected by SDI, was negatively associated with ongoing pregnancy (correlation coefficient -4.3, P=0.03). There was a non-statistically significant trend towards lower ongoing pregnancy rates with a NLBD microbiome.

CONCLUSIONS: Increasing species diversity negatively impacts ongoing pregnancy rates following transfer of a euploid blastocyst. In addition, there is a trend towards lower ongoing pregnancy with a NLBD microbiome. Vaginal and cervical microbiome assessments were highly correlated indicating that vaginal samples alone may be sufficient. Recruitment for the study remains underway.

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RISK OF PREGNANCY FAILURE IN AN OPTIMIZED UTERINE ENVIRONMENT: LIVE BIRTH RATE FROM PGT-A EUPLOID EMBRYOS IN A PROVEN UTERUS. Renee N. Rivas, MD, PhD,[a] Michael K. Simoni, MD,[a] Alan S. Penzias, M.D.,[b] Denny Sakkas, PhD,[b] Pasquale Patrizio, M.D.[c] [a]Yale New Haven Hospital, New Haven, CT; [b]Boston IVF, Waltham, MA; [c]Yale Fertility Center, New Haven, CT.

OBJECTIVE: Assess the magnitude of the pregnancy failure rate from the transfer of euploid embryos after Pre-implantation Genetic Testing for Aneuploidy (PGT-A) into a proven uterine environment. An optimal uterine environment, or