cycle. Vaginal P inserts at a dose of 100mg TID for six weeks cost $1600.08. One applicator of P gel daily for six weeks costs $1404.69. The total cost savings per live birth of adding P luteal support to GND-IUI cycles is $4068.99 (95% CI $220.39-6663.84). Varying the cost of P support, the sensitivity analysis demonstrated that P support was cost-effective as long as P costs < $569.31/week ($3415.86 for six weeks). Varying the cost of GND-IUI, the sensitivity analysis demonstrated that P luteal support was cost-effective as long as the cost of the GND-IUI cycle is ≥ $1215. P support was cost-effective across the published 95% CI for live birth increase, ranging from $220 to $6664 cost savings per live birth.

CONCLUSIONS: Daily vaginal P supplementation after GND-IUI improves live birth rates and effectively reduces the overall treatment cost per live birth. These findings persisted in the analyses of vaginal P inserts and P gel as well as in all sensitivity analyses of live birth rates and the costs of GND-IUI and P support. Given the significantly higher birth rates with P supplementation and the present findings demonstrating cost-effectiveness, P luteal support should be recommended for all GND-IUI cycles.

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P-655 Wednesday, November 1, 2017

DOES LUTEAL PHASE SUPPORT IMPROVE PREGNANCY OUTCOME IN NATURAL FROZEN-THAWED EMBRYO TRANSFER CYCLES? H. Sun,[a] K. Lee,[a] I. Park,[a] J. Kim,[a] H. Chi,[a] S. G. Kim,[a] Y. Kim,[a] J. Park,[a] J. Jo.[b] [a]Mamapapa & Baby OB&GY Clinic, Ulsan, Korea, Republic of; [b]Ellemedi OBGY, Changwon, Korea, Republic of.

OBJECTIVE: It is well known that luteal phase support (LPS) with progesterone improves outcomes in fresh IVF-ET cycles. Also in hormonally controlled frozen-thawed ET cycles, high dose progesterone supplementation has resulted in higher clinical pregnancy rate. In general, endogenous production of progesterone is sufficient to support implantation in a natural ovulation cycle of fertile women. Therefore we can make a supposition that additional progesterone does not change pregnancy outcomes in natural FET cycles. The aim of this study is to determine the impact of additional luteal phase support on pregnancy outcomes in natural FET cycles.

DESIGN: This retrospective cohort study included 1158 cycles undergoing FET in natural cycles between September 2009 and March 2017.

MATERIALS AND METHODS: By ultrasound examination and monitoring of serum hormone levels, exact ovulation day was assessed. The cryopreserved embryos were transferred 3 days after ovulation. 474 patients (Group A) received daily vaginal progesterone gel starting from the day of embryo transfer and 684 patients (Group B) did not receive it.

RESULTS: In each group, age, AMH level, number of transferred embryos and percentage of top quality embryos reflected no differences. Total pregnancy rate was 40.7% (471/1158) and ongoing pregnancy rate was 37.7% (436/1158). Pregnancy rate was significantly higher in group A (received progesterone) than in group B (not received progesterone) [48.3% (229/474) vs. 35.4% (242/684), P<0.05]. Ongoing pregnancy rate was also significantly higher in group A (received progesterone) [44.5% (211/474) vs. 32.9% (225/684), P<0.05]. There was no significant difference between two groups in the spontaneous abortion rate [7.9% (18/229) vs. 7.0% (17/242), p=0.25].

CONCLUSIONS: This study showed that vaginal progesterone supplementation significantly improves pregnancy rates in natural FET cycles. It is probably because the women who undergo IVF cycles are often subfertile and they may have suboptimal progesterone level. Therefore, we recommend that clinician should consider luteal phase support in natural FET cycles.

P-656 Wednesday, November 1, 2017

DOES THE TIME OF STARTING PROGESTERONE (P4) LUTEAL SUPPORT (LS) AFFECT THE EASE OF EMBRYO TRANSFER (ET) IN LONG AGONIST PROTOCOL DOWN-REGULATED IVF CYCLES? A RANDOMIZED CONTROLLED TRIAL. M. E. Ghanem,[a,b] M. H. Bedairy,[a] I. Elbahlol,[c] A. Shaaban,[d] M. A. Emam,[e] L. A. Al Boghdady,[f] A. S. Helal,[e] A. Elmetwally.[c] [a]IVF, Mansoura Faculty of Medicine, Mansoura, Egypt; [b]MIFC, Mansoura, Egypt; [c]Mansoura Faculty of Medicine, Mansoura, Egypt; [d]Faculty of Medicine, Alazhar University, Mansoura, Egypt; [e]Obstetrics & Gynecology, Mansoura University, Mansoura, Egypt; [f]Mansoura Integrated Fertility Center, Mansoura, Egypt.

OBJECTIVE: Animal studies showed that anatomical changes are indicative of P4-induced changes that could affect the ***ease of embryo transfer (ET)*** through the cervical canal [i]. Although clinical trials have demonstrated that timing the start of P4 -LS on day of egg retrieval (ER) or day of ET does not affect cycle outcome[ii]; there remains the possibility of effects on some aspects of ET. The objective of this study was to compare the effects of starting P4- LS on day of ER or on day of ET on the ease of ET [iii] and cycle outcome.

DESIGN: RCT: Clinical trial identifier NCT03040830

MATERIALS AND METHODS: A total of 171 eligible embryo transfers were randomly allocated into group A (86) starting LS as daily IM 100 mg prontogest on day of ER, or group B (85) starting the same dose of P4 on the day of ET. Inclusion criteria were: *age ≤38 years*, *nulliparous*, *first ICSI trial*, *long agonist protocol*, *normal responder* and *easy mock transfer* . We used the same technique of ET and the same type of ET catheter in all transfers. Transfer was considered difficult if the inner ET catheter was blood stained and/ or sounding or dilating the cervix was needed to advance the loaded embryo catheter. We considered ET easy if it was without resistance with or without cervical traction, with or without blood staining of the *outer* sheath. The **primary outcome** measure was the ***overall ratio of difficult ET*** and the ratios in day 3 and day 5 ET. The **secondary outcome** measure was the clinical pregnancy and implantation rates.

RESULTS: **Patient features** : Groups A and B respectively (mean ±SD) *age* (years) 31.20 ±3.20 & 30.5 ±4.2 (p=0.22), *eggs retrieved* 11.85±7.1& 13.25±8.0 (p=0.23), *embryos transferred* 2.74±0.91& 2.81±0.62 (p=0.55). *Number (%)* of blastocyst transfer respectively 42/86 (48.8) & 39/85(45.8) (p=0.76). **Primary outcome** : *The overall number* (%) of difficult ET in A & B were respectively 38/86 (44.1) & 21 /85 (24.7) (p=0.009). ***Day 3 difficult ET number (%)*** **13 /43(30.2) & 11 /45(24.4)(p=0.63).** ***Day 5 difficult ET number (%)*** **27/43 (62.7) & 10/40 (25.0) (p=0.0008) Secondary outcome** : Clinical pregnancy rates for groups A and B were respectively 33/86(38.3%) &38/85 (44.7%) (p=0.43)Implantation rates were 38/190(20.0%) & 45/200(22.5%) (p=0.62).

CONCLUSIONS: Starting P4 support on ER day is associated with significantly higher ratio of difficult day 5 *but not day* 3 ET compared with starting LS on ET day. Our results confirmed a deleterious effect of prolonged P4 administration on ET. The outcome was not affected because of the limited sample size in day 3 and 5 subgroups. Based on our data starting P4 luteal support on the day of embryo transfer is recommended.

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ENDOMETRIUM

P-657 Wednesday, November 1, 2017

ENDOMETRIAL RECEPTIVITY AND PREGNANCY RATES ARE HIGHER AFTER 7 DAYS OF PROGESTERONE IN MEDICATED FET CYCLES. A. M. Propst, L. Hansard, K. Silverberg, M. Hegtvedt, N. Z. Burger, T. C. Vaughn. Texas Fertility Center, Austin, TX.

OBJECTIVE: To determine if Endometrial Receptivity Analysis (ERA) testing will improve implantation and pregnancy rates in patients undergoing medicated frozen embryo transfer (FET) cycles.

DESIGN: Retrospective study in a large private practice fertility clinic.

MATERIALS AND METHODS: We included all patients who had one or more ERA tests (Igenomix) in our clinic from 1/2016 to 5/2017. Patients were treated with oral and/or vaginal estradiol and begun on vaginal or intramuscular progesterone when the endometrial thickness was 7 mm or more and the serum progesterone level was less than 1 ng/ml. The first endometrial biopsy ERA test was done on the sixth day of progesterone. Patients who had a receptive ERA on day 6 of progesterone had a medicated FET with the

Day 6 or Day 7 of Progesterone

Days of Progesterone	Pre-Receptive ERA	Receptive ERA	Post-Receptive ERA	PGS Embryos	Pregnacy Rate per FET	Ongoing Rate Per FET
Day 6	74.1%	23.5%	2.4%	61.1%	55.6%	44.4%
Day 7	7.8%	78.9%	13.2%	68.4%	81.6%	71.1%
p value	p<0.01	p<0.01	p=0.58	p=0.59	p=0.04	p=0.05

transfer on day 6 of progesterone. Patients who had a pre-receptive ERA on the sixth day of progesterone were offered a repeat ERA or FET on day 7 of progesterone. A serum quantitative hCG was drawn 9 days after a blastocyst FET and repeated 48 to 72 hours later. A transvaginal ultrasound was performed by 7.5 weeks estimated gestational age. Statistical calculations were performed with a Chi-Squared test.

RESULTS: A total of 85 women, ages 27-51, had an ERA test on the 6th day of progesterone. The majority of patients had a prior failed FET (70%). Only 24% of the ERA tests on day 6 of progesterone were receptive (Table 1). Repeat ERA testing on day 7 of progesterone was performed on 38 patients. The majority of day 7 progesterone patients had an ERA test that was receptive (79%). Ninety percent of patients had a single embryo transfer and 10% a double embryo transfer. The pregnancy rates were significantly higher in our patients having an embryo transfer on the seventh day of progesterone.

CONCLUSIONS: Women undergoing a medicated FET cycle were significantly more likely to have a receptive endometrium, by ERA testing, on the 7th day of progesterone. There were also higher pregnancy rates in women having a transfer on the 7th day of progesterone in medicated FET cycles.

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UTERINE FLUID LIPIDOMIC AS AN ENDOMETRIAL RECEPTIVITY PREDICTIVE TOOL. D. P. Braga,[a,b,c] D. A. Montanni,[c] A. S. Setti,[a,b] G. Pilli,[d] A. Godoy,[d] M. N. Eberlin,[d] A. Iaconelli, Jr.,[a,b] E. Borges, Jr.,[a,b] E. G. Lo Turco.[c] [a]Fertility Medical Group, Sao Paulo, Brazil; [b]Instituto Sapientiae - Centro de Estudos e Pesquisa em Reprodução Assistida, Sao Paulo, Brazil; [c]Disciplina de Urologia, Departamento de Cirurgia – UNIFESP, Sao Paulo, Brazil; [d]Laboratðrio ThoMSon de Espectrometria de Massas – Instituto de Química - UNICAMP, Campinas, Brazil.

OBJECTIVE: To make use of the analytical power of mass spectrometry to identify lipids differentially represented in the receptive endometrium, when compared with lipids represented in non-receptive endometrium.

DESIGN: Prospective cohort study.

MATERIALS AND METHODS: Uterine fluid samples were collected from 40 patients undergoing endometrium preparation for frozen/thawed embryo transfers, in a private university-affiliated in vitro fertilization center. Samples, collected from Aug/2015 to Dec/2016, were derived from cycles in which one or two high quality blastocysts were transferred. Samples were split into two groups according with the pregnancy outcome: Positive Group (n=20) and Negative Group (n=20). The lipid profile of samples from the Positive Group was compared with that of samples from the Negative group. Lipid extraction was performed by Bligh-Dyer protocol. The following analyses were obtained by MALDI-TOF MS. The mass/charge ratios of the lipids were scanned (m/z 600-1200 Da) in positive mode. The spectral data of m/z and intensity were obtained using FlexAnalysis and statistically analyzed using MetaboAnalyst 3.0 software. Potential biomarkers of endometrial receptivity were selected through the S-Plot scores using Ortho-PLSDA test.

RESULTS: Eleven lipids were differentially represented among the groups. Seven lipids were hiperrepresented in the Positive Group, and four lipids in the Negative Group. These lipids were identified using Lipid Maps database. Phosphatidic acid (PA) that induces decidualization of endometrial stromal cells was found as a differentially represented lipid in the Positive Group, while ceramide was found as a potential lipid biomarker of non-receptive endometrium, since it may disturb sphingolipid metabolism during decidualization.

CONCLUSIONS: Possible biomarkers of endometrial receptivity or endometrial receptivity failure were suggested. Ceramide, hiperrepresented in non-receptive endometria may point to a possible temporal displacement on the window of implantation. This information may be especially important for patients with repeated implantation failure, who may benefit of a personalized embryo transfer.

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TRILAMINAR ENDOMETRIAL PATTERN CORRELATES WITH HIGHER CLINICAL PREGNANCY RATES IN FROZEN EMBRYO TRANSFER CYCLES. V. A. Flores, D. A. Kelk, P. H. Kodaman. Department of Obstetrics, Gynecology and Reproductive Sciences, Yale School of Medicine, New Haven, CT.

OBJECTIVE: Endometrial thickness, pattern, and blood flow, have been used as indicators of endometrial receptivity. While most studies indicate a linear correlation between endometrial thickness and successful implantation, there is disagreement with respect to the ability of endometrial pattern to predict clinical pregnancy. The objective of our study was to examine whether endometrial pattern used in conjunction with endometrial thickness has a positive impact on clinical pregnancy rate in frozen embryo transfer (FET) cycles.

DESIGN: Retrospective cohort study of 100 FET cycles at an academic center.

MATERIALS AND METHODS: FET cycles from 2015-2016 were examined to assess endometrial pattern as well as thickness prior to IM progesterone start. The endometrial pattern was classified as trilaminar (A), intermediate (B), or homogenous (C). Data regarding patient age, BMI, peak estradiol (E2) levels, days on estrace prior to progesterone start, and number of embryos transferred were also collected. Donor egg/embryo and PGS cycles were excluded as were natural thaw cycles and patients with Asherman's syndrome. The primary outcome was clinical pregnancy rate (CPR), with a secondary outcome of multiple gestations. A logistic regression model was used for statistical analysis.

RESULTS: Clinical pregnancy rates are referenced in Table 1.

Lining Profile and Clinical Pregnancy Rate

Lining Type	# of Patients	Avg. Age	Clinical pregnancy rate (%)
A	44	34.1	65.9
B	27	34.3	48.1
C	29	33.7	44.8

Pattern A, endometrial thickness, and E2 were all independently associated with clinical pregnancy (p-values of 0.013, 0.027, and 0.031, respectively). Pattern A was associated with a 3.05 better odds of pregnancy, when compared to Pattern B or C (95% CI [1.24, 7.53]). There was no significant difference in pregnancy success between Patterns B or C. The odds ratio per unit increase in endometrial lining was 1.24 (1.01, 1.53). The p-value for the overall model fit was 0.021. Days on estrace and BMI were not associated with CPR, and multiple gestation was only associated with number of embryos transferred, not endometrial pattern or thickness.

CONCLUSIONS: While endometrial thickness is an important sonographic marker of endometrial receptivity, the present data show that a trilaminar endometrial appearance is also a significant, independent predictor of implantation with a 3-fold increase in CPR in FET cycles. Therefore, endometrial pattern, in addition to thickness, should be considered prior to transfer of cryopreserved embryos.

P-660 Wednesday, November 1, 2017

ENDOMETRIAL CAVITY LENGTH, NOT JUST ENDOMETRIAL CAVITY THICKNESS, AS A PREDICTOR FOR LIVE BIRTH RATE IN PATIENTS USING DONOR OOCYTES. C. B. Lewis,[a] E. Jungheim,[b] A. Arbelaez,[a] M. Williams,[b] A. R. Cooper.[c] [a]Pediatric Endocrinology, Washington University, St. Louis, MO; [b]Obstetrics and Gynecology, Washington University, St. Louis, MO; [c]Centers for Reproductive Medicine and Wellness, Swansea, IL.