CONCLUSION: This analysis indicates that vaginal progesterone inserts (Endometrin®) provide effective lutal support in IVF cycles compared to intramuscular progesterone in oil. With greater patient tolerability Endometrin® provides a more patient friendly form of luteal support without compromising efficacy.

Supported by: Ferring Pharmaceuticals Inc.

O-69 Monday, October 25, 2010 04:30 PM

PROGESTERONE VAGINAL GEL VS. INTRAMUSCULAR PROGESTERONE IN OIL FOR LUTEAL SUPPORT IN IVF: A LARGE, PROSPECTIVE TRIAL. K. Silverberg, T. C. Vaughn, L. Hansard, N. Burger, T. Minter. Texas Fertility Center, Austin, TX.

OBJECTIVE: To compare the efficacy of vaginal progesterone gel and intramuscular (IM) progesterone in oil for luteal phase support in IVF cycles.

DESIGN: Prospective trial in a large private practice.

MATERIALS AND METHODS: All patients were treated with either an oral contraceptive/leuprolide acetate down regulation protocol or a microdose flare protocol, depending on clinical indications. Ovarian stimulation was accomplished with recombinant FSH alone in the down regulated protocol; recombinant LH was added in the flare protocol. All patients received recombinant hCG at oocyte maturity, followed by transvaginal oocyte retrieval 36 hours later. Patients were prospectively assigned to either vaginal (Crinone® 8% vaginal gel) or IM progesterone in oil, beginning 2 days after the oocyte retrieval. Embryos were transferred either 3 or 5 days following retrieval based on the number and quality of embryos on Day 3. A serum hCG was obtained 14 days after oocyte retrieval and repeated weekly if positive until transvaginal sonography was performed at 7 weeks' gestational age to confirm cardiac motion in an intrauterine gestation.

RESULTS: 511 consecutive patients were enrolled in the study; 474 completed participation. 37 were excluded for no autologous embryo transfer (freeze all, donor recipients, failed fertilization/cleavage). There were no demographic differences between the 2 treatment groups. Overall, patients who received vaginal progesterone gel had higher pregnancy (70.9% vs. 64.2%) and delivery (51.7% vs. 45.4%) rates than did patients who received IM progesterone. Patients 35 & under who received vaginal progesterone gel had significantly higher delivery rates (65.7% vs. 51.1%, $p<0.05$) than did patients who received IM progesterone. There were no differences, regardless of age, in the rates of biochemical pregnancy, miscarriage, or ectopic pregnancy.

CONCLUSION: Luteal phase support with vaginal progesterone gel produced significantly higher pregnancy rates than IM progesterone in younger patients undergoing IVF.

O-70 Monday, October 25, 2010 04:45 PM

FMR1 TRINUCLEOTIDE REPEAT SIZE IS PREDICTIVE OF OVARIAN RESPONSE. M. Luna, G. Vela, B. Sandler, L. Grunfeld, T. Mukherjee, A. B. Copperman. Reproductive Medicine Associates of New York, New York, NY; Department of OBGYN and Reproductive Science, Mount Sinai School of Medicine, New York, NY.

OBJECTIVE: Premature ovarian failure(POF) is prevalent in 13-26% of FMR1 premutation carriers. This risk appears to increase as trinucleotide size increases up to 99 repeats, after which the risk plateaus or decreases. We evaluated women who were intermediate risk or premutation carriers undergoing IVF to determine whether CGG repeat size correlates with ovarian response.

DESIGN: Retrospective.

MATERIALS AND METHODS: Patients undergoing IVF with fragile X DNA testing were identified. Based on the American College of Medical Genetics, patients with 41-54 repeats were classified as intermediate risk and those with 55-199 repeats as premutation carriers. Only patients with CGG repeats ≥ 41 were included for analysis. Correlation between FSH, peak E2, total GND dose, number of oocytes, fertilization and the number of CGG repeats was performed using Pearson's correlation. Additionally, comparison of cycle outcomes of intermediate risk and premutation carrier patients was carried out using ANOVA and chi-square.

RESULTS: In total, 44 patients initiated 77 cycles. A significantly positive correlation was found between total GND dose and CGG repeats($p=0.0007$; $r=0.38$). Although age was similar, FSH and total GNDs were significantly higher in the premutation group, accompanied by lower peak E2 levels.

	INTERMEDIATE RISK (n=52)	PREMUTATION (n=25)	P
Age	34.2 ± 4.8	34.0 ± 5.1	.83
FSH	7.1 ± 3.2	10.2 ± 4.2	.002*
Peak E2	2098 ± 1005	1535 ± 1356	.043*
Total GND dose (IU)	3248 ± 1380	4236 ± 2040	.014*
Cancellation	7.2%	40%	.001*
No. retrieved oocytes	17.1 ± 10.3	14.9 ± 12.2	.49
Fertilization	61%	62.3%	.77
Clinical pregnancy	25/46 (54.3%)	4/15 (26.6%)	.12
Implantation	28.9%	20%	.41
Loss	4/25 (16%)	0/4 (n/a)	.39

CONCLUSION: A positive correlation, extending to intermediate risk patients, was found between CGG repeat size and total GND dose. Trinucleotide size may be correlated with ovarian response, and evidence of ovarian dysfunction can be found in women with >54 repeats.

O-71 Monday, October 25, 2010 05:00 PM

DIFFERENTIAL GENE EXPRESSION PROFILES BETWEEN HUMAN EMBRYO ON DAY-3 AND TROPHOBLAST CELLS ON DAY-5: SPECIFIC MOLECULAR SIGNATURE. S. Assou, D. Haouzi, F. Pellestor, H. Dechaud, J. De Vos, S. Hamamah. CHU Montpellier, Institute for Research in Biotherapy, Hôpital Saint-Eloi, INSERM U847, Montpellier, France; CHU Montpellier, Unité Biologie Clinique d'AMP - DPI, Hôpital Arnaud de Villeneuve, Montpellier, France; CHU Montpellier, Unité de Thérapie Cellulaire, Hôpital Saint Eloi, Montpellier, France.

OBJECTIVE: The first week of human development is marked by the differentiation of the early embryo into the inner cell mass (ICM) and trophectoderm (TE). Whereas the oocytes, embryos and human embryonic stem cells (hESC) derived from ICM, have been particularly studied, the TE is still largely unexplored. Here, we report the human TE transcriptome by whole genome expression profiling, and we compare this transciptome with that of the embryo on day-3.

DESIGN: Five human TE samples (day-5) were separated from the ICM under dissecting microscope and donated embryos on day-3 were collected after informed consent from patients participating in our *IVF* program.

MATERIALS AND METHODS: After total RNA extraction, amplification and hybridization, each sample was individually analyzed with Affymetrix Genechip human microarrays (HG-U133 Plus 2.0). Statistical analysis was carried out with Significance Analysis of Microarrays (SAM) method with 2-fold cut-off and false discovery rate (FDR $< 5\%$).

RESULTS: Out of 25,970 analysed transcripts a list of 910 genes were significantly over-expressed in TE samples. This TE molecular signature comprised genes known to be involved in murine TE biology such as *GATA3* (x704, $p<0.02$), cytoskeleton protein keratin 18 (x524.2, $p<0.02$) and new candidates that can serve as markers for human TE health and many that contribute to the TE development. The very high expression level of extracellular matrix related *LAMA1* (x324.3, $p<0.02$) in TE suggested that this laminin alpha1 could play an important role in TE specification. Conversely, human embryo on day-3 overexpressed numerous different zinc finger transcription factors, including *ZNF595.*.

CONCLUSION: The transcriptomic analysis of TE and embryos on day-3 improve our understanding of the molecular network controlling human trophoblast specification and pluripotency. In addition, the results establish a solid basis for the identification of potential biomarkers for blastocyst viability.

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