No. of good cleavage stage embryos on day 2	1-5	6-8	9-12	>13
No. of eSETs	245	430	468	402
Age (Mean±SEM)	32.4±3.2	32.3±3.3	31.8±3.2	31.5±3.1
Mean number of day 2 embryos	4	7	10	17
Mean number of blastocysts vitrified	2	3	5	8
Total number of blastocysts vitrified	433	1251	2250	3159
% Ratio of day 5 vs. day 6 vitrified	68 vs. 32	67 vs. 33	66 vs. 34	71 vs. 29
Clinical pregnancy/eSET (%)	54.3[a]	55.1[a]	56.5[a]	52.5[a]
Implantation rate (%)	62[a]	62.1[a]	63.2[a]	62.2[a]
Babe-take-home rate (%)	54.3[a]	55.1[a]	55.5[a]	52[a]
Sets of Monozygotic twins (n)	7	3	4	5
Live births (n)	133	237	260	209

aχ^2, P<0.05

97.5%, Day-3 good-quality embryo rate 70.6% versus 74.5%, Day-5 blastocyst formation rate 62.2% versus 69.4%, Day-5 good-quality blastocyst rate 37.5% versus 44.2%, and Day-6 blastocyst formation rate 9.8% versus 5.6%, respectively. There was no significant difference between the two groups in these parameters.

CONCLUSIONS: The outcomes with the two time-lapse incubation and imaging systems showed no statistical difference in the present study; even though, the new ES+ device tended to yield higher blastocyst formation than the ES-D. The ES+ provides an incubation environment that is at least equivalent or superior to that of the ES-D, ES-D occupied area per patient was 562.8 cm^2 per patient and , ES + was 220.0 cm^2 per patient, and has more than double the capacity of the ES-D. Thus, the ES+ is shown to be a highly attractive upgrade for a busy lab such as ours.

P-141 Tuesday, October 31, 2017

ELECTIVE SINGLE EMBRYO TRANSFER (ESET): DOES THE NUMBER OF MORHOLOGIC GOOD CLEAVAGE EMBRYOS ON DAY 2 AFFECT OUTCOME?

J. Liebermann, J. Mathews, S. Sanchez-Julias, A. Diamond, M. L. Uhler, J. Hirshfeld-Cytron, C. Sipe. Fertility Centers of Illinois, Chicago, IL.

OBJECTIVE: After more than 3 decades since the birth of Louse Brown, the definition of success in infertility treatment has changed dramatically. Today, quality of IVF is measured on three criteria; 1) term birth, 2) birth weight and 3) singleton pregnancy. These goals can only be achieved by performing embryo transfer of one selected embryo at a time, preferably at the blastocyst stage. For those reasons, it is utterly important to have well defined criteria in place to determine which patients should be pushed to day 5 for an eSET. Therefore, we examine if the number of good quality cleavage stage embryo available on day 2 has on impact on the baby-take-home rate after eSET.

DESIGN: Retrospective analysis.

MATERIALS AND METHODS: A total of 1545 eSETs were performed from February 2007 to February 2016. The average maternal age was 32±3.2yrs. Oocytes had undergone ICSI and cultured in single step media (Global) for extended culture under low oxygen tension (5%). eSETs were divided in four groups based on the number of available good cleavage stage embryos on day 2 defined as 4-cell stage embryos without fragmentation. The 4 groups were compared in terms of baby-take-home rate. Chi square test was used for statistical analysis of the data.

RESULTS: There was no significant difference among the groups in regards to patient's age, clinical pregnancy, implantation or baby-take-home rate. Regardless of the mean number of day 2 embryos, in all groups about 50% were vitrified at the blastocyst stage. Even the ratio between day 5 and day 6 vitrified blastocysts was similar in all groups.

CONCLUSIONS: Our study found that when there are 5 or less day 2 good morphologic embryos, the patient can be confidently pushed to a day 5 eSET. The cryopreservation utilization rate was similar among the groups. Overall, stimulation toward lower egg numbers and in turn to less cleavage stage embryos provides a safe opportunity for the embryology laboratory to push patients under age 35 for an eSET. Along with the low number of multiple births, this approach delivers a high pregnancy rate, moving towards the endpoint of a single, safe and healthy live birth.

P-142 Tuesday, October 31, 2017

CULTURING EMBRYOS TO DAY 7. A VIABLE OPTION FOR IVF PATIENTS?

H. J. Werland,[a] M. VerMilyea,[b] K. Silverberg.[c] [a]IVF Lab, Ovation Fertility, Austin, TX; [b]Ovation Fertility, Austin, TX; [c]Texas Fertility Center, Austin, TX.

OBJECTIVE: To determine if culturing embryos to Day 7 improves IVF cycle outcomes.

DESIGN: A retrospective analysis of 698 FET cycles was performed to evaluate the value of culturing embryos to Day 7.

MATERIALS AND METHODS: Embryos were cultured in continuous culture medium (Irvine Scientific) from fertilization check through Day 7 without media renewal. All freeze quality blastocysts on Day 5, 6, or 7 based on morphological parameters were either vitrified (freeze all cycles) or biopsied and vitrified for PGT. All embryos were collapsed by laser prior to vitrification with the Irvine Scientific vitrification kit. All embryos were warmed 2-4 hours prior to the frozen embryo transfer.

RESULTS: Of 698 FET's, 426 involved exclusively Day 5 embryos, 249 Day 6 and 23 Day 7. The average number of embryos transferred in each group were Day 5: 1.1 ; Day 6: 1.06 ; Day 7: 1.04 (p=NS) Implantation rates were 49%, 51%, and 17%, respectively. D5 vs. D6 (NS) ; D5 vs. D7 $p < 0.05$; D6 vs. D7 $p < 0.05$.

CONCLUSIONS: Culturing embryos to Day 7 does result in more viable pregnancies1,2. Although vitrified Day 7 embryos are usually the last selected for FET, some patients may only have Day 7 euploid embryos to transfer or slower developing embryos which only reach freeze-quality on Day 7. Although data are limited, culturing embryos to Day 7 appears to be beneficial, as this increases the total number of pregnancies without

FET results

Day 5 FET's (426)	Positive bHCG	Sacs	FHB's	Total # of embryos transferred	% Implantation rate
Freeze all (255)	151 (59%)	137 (54%)	124(49%)	291	47%
PGT (171)	101 (59%)	96 (56%)	88 (51%)	183	56%
Day 6 FET's (249)					
Freeze all (123)	70 (57%)	67 (54%)	55 (45%)	151	44%
PGT (126)	78 (62%)	75 (59%)	69 (55%)	129	60%
Day 7 FET's (23)					
Freeze all (10)	3 (30%)	1 (10%)	1 (10%)	11	9%
PGT (13)	3 (23%)	3 (23%)	3 (23%)	13	23%

significantly increasing the laboratory workload. Further investigation of ploidy status from Day 7 embryos may explain the lower implantation rate.

References:

1. Su, Yu, et al. Aneuploidy analysis in day 7 human blastocysts produced by in vitro fertilization. Reproductive Biology and Endocrinology 14.1 (2016): 20.
2. Li, M., et al. Day 7 blastocysts, should they be discarded or cryopreserved?. *Fertility and Sterility* 90 (2008): S427.

P-143 Tuesday, October 31, 2017

EARLY DAY 2 HATCH-ALL TECHNIQUE IMPROVES EMBRYO DEVELOPMENT AND PREGNANCY OUTCOME. G. A. Abdo, M. R. Goodwin, A. G. Abdo, F. Sharara. Virginia Center for Reproductive Medicine, Reston, VA.

OBJECTIVE: To determine the impact of early laser-assisted hatching of all embryos on day 2 (ELAH) on blastocyst formation and pregnancy outcome compared to no laser-assisted hatching (NLAH). Our previous study indicated that day 3 laser assisted hatching (LAH) improved embryo development and pregnancy outcome. The current study tests the hypothesis that performing ELAH will result in increasing usable (transferred + cryopreserved) blastocyst formation (UBF) and improvement in pregnancy rates compared to no intervention.

DESIGN: Retrospective analysis.

MATERIALS AND METHODS: Outcome of 476 ICSI cycles performed at a private ART center between 2010 and 2016 were reviewed. Of these, cycles that undergone ELAH on day 2 (N=95) were compared to cycles without any laser-assisted hatching (NLAH), which served as controls (N=381).

RESULTS: There were no differences in the number of total oocytes retrieved (11.16 vs 10.44 in ELAH vs NLAH, respectively, *P =<0.228*), nor MII oocytes (8.48 vs 7.61 in ELAH vs NLAH, respectively, *P =0.064*). Cycles with ELAH had significantly more UBF (3.00 vs 2.54 in ELAH vs NLAH respectively, *P=0.019*) and significantly more cryopreserved blastocysts (1.67 vs 0.63 in ELAH vs NLAH respectively, *P=<0.001*). Although NLAH had a significantly higher number of embryos transferred (2.06 vs 1.57 in NLAH vs ELAH, respectively *P=<0.001*), there was a significantly higher pregnancy rate in ELAH cycles (68.42% vs 50.91% in ELAH vs NLAH, respectively, *P=0.002*). In order to determine the effect of ELAH (day 2) versus LAH (day 3), 95 cycles with ELAH were compared against 146 cycles with LAH. There was no difference in UBF (3.0 vs 3.2 in ELAH vs LAH, respectively, *P=<0.421*) and no difference in cryopreserved blastocysts (1.67 vs 1.84 in ELAH vs LAH, respectively, *P=0.581*). There were no differences in age, number of retrieved oocytes, number of MII oocytes, or number of fertilized zygotes between ELAH and LAH cycles. There was no difference in pregnancy rate (68.4 % vs 68.4% in ELAH vs LAH, respectively, *P=0.991*) and no difference in number of transferred embryos in ELAH vs LAH (1.53 vs 1.49, respectively, *P= 0.573*). In a total of 622 cycles, when 241 cycles with LAH or ELAH (LAH/ELAH) were compared to 381 NLAH cycles, there was an improvement in the pregnancy rate (67.8% vs 50.91% in LAH/ELAH vs NLAH, respectively, *P=<0.001* and in UBF (3.15 Vs 2.54 in LAH/ELAH vs NLAH respectively *P=<0.001)*.

CONCLUSIONS: Embryos subjected to early laser-assisted hatching on day 2 or 3 were more likely to form usable blastocysts and establish a pregnancy after transfer than embryos without laser assisted hatching. Blastocyst formation and pregnancy rate were similar whether laser assisted hatching took place on day 2 or day 3. Blastocysts developing after laser assisted-hatching on day 2 or day 3 are more likely to be of higher quality, result in pregnancy, and improve clinical outcomes.

P-144 Tuesday, October 31, 2017

WITHDRAWN

P-145 Tuesday, October 31, 2017

COHORT EMBRYO SELECTION (CES): A QUICK AND SIMPLE METHOD FOR SELECTING CLEAVAGE STAGE EMBRYOS THAT WILL BECOME HIGH QUALITY BLASTOCYSTS (HQB). I. Dimitriadis,[a] G. Christou,[b] K. Dickinson,[a] S. McLellan,[a] M. Brock,[a] I. Souter,[c] C. L. Bormann.[a] [a]Massachusetts General Hospital, Boston, MA; [b]Obstetrics and Gynecology, Massachusetts General Hospital, Boston, MA; [c]Obstetrics Gynecology/REI Division, Harvard Medical School-Massachusetts General Hospi, Boston, MA.

OBJECTIVE: To evaluate the ability of a novel embryo selection method [CES: simultaneous assessment, with a single image, of all the embryos in a patient's cohort at specific time-points] to predict HQB formation compared to traditional methods of embryo selection [Day 3 morphology (D3M) and adjunctive morphokinetic time-lapse (TLM)], in which each embryo is evaluated individually.

DESIGN: Retrospective case-control.

MATERIALS AND METHODS: We examined 50 infertile women (9/2014-12/2015) with their entire embryo cohort imaged in the EmbryoScope from Day 1 to Day 5 who also had at least one blastocyst on day 5. Images of the patients' embryo cohorts were taken at the following time-points: 28 hours (D1), 44 hours (D2) and 68 hours (D3). The images were examined by 3 embryologists, blinded to both D3M and TLM scores, who chose the top-quality embryo from a single image showing all embryos in the patient's cohort at the following time-points: D1, D2, D3, D1+D2, D1+D3, D2+D3, D1+D2+D3. Prediction rates of overall blastocyst and HQB (defined as being at minimum an expanded blastocyst with a good ICM and good trophectoderm) were compared to D3M and TLM. Chi-square test used; $P<0.05$ was considered statistically significant.

RESULTS: The overall blastocyst formation prediction rate was higher with the D3 CES method when compared to D3M grading alone (96% vs 86%; p=0.06, respectively). When D1 and D2 CES were compared individually to D3M, rates of blastocyst prediction were similar amongst the methods (94% and 94% vs 86%; p=0.20, respectively). The highest overall