oil. The device was inserted into the patient's vagina for incubation and carried for 5 days before she returned to have embryo development evaluated and an embryo transfer. IUI's were performed with gradient prepared semen per standard protocols. Data was collected for a single calendar year in 2017.

RESULTS: A total of 36 patients, between ages 27 and 42, opted to have IVC cycles performed. All patients were able to tolerate the device well, with no adverse events requiring premature removal of the device. The per-start positive biochemical pregnancy rate was 52% and the ultrasound confirmed pregnancy rate was 47%. The per-transfer pregnancy rates were 69% and 63% respectively with a total of 28 transfers performed (a 22% non-transfer rate). The pregnancy rates for IUI performed in the same calendar year were 13% and 12% respectively for patients in the same age bracket with a total of 869 cycles performed.

CONCLUSIONS: IVC with day 5 blastocyst transfers appears to offer an appreciable pregnancy rate increase when compared with IUI cycles. While IVC cannot compete with full IVF cycles, due to inherent treatment limitations, it may offer a more efficacious first treatment option for infertility patients that meet the selection criteria than several rounds of IUIs. However, despite success for a large percentage of patients, we observed a high non-transfer rate of 22% due to either no fertilization or poor embryo progression. Although disappointing, these patients can now progress to full IVF cycles sooner than if they had continued with IUI cycles as IVC cycles offer more diagnostic value than IUIs. More research is needed to understand if IVC can effectively, in terms of cost and patient success, be added to most center's treatment repertoires and become an additional standard of care.

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THE NEW EMBRYO CULTURE MEDIUM BASED ON THE AMINO ACID CONCENTRATION OF HUMAN OVIDUCTAL FLUID ENHANCE THE EMBRYO DEVELOPMENTAL ABILITY; RANDOMIZED TRIAL. T. Utsunomiya, Y. Kumasako, Y. Kai, F. Kawabe. St.Luke Clinic, Oita City, Japan.

OBJECTIVE: Sequential media and single step medium are the most widely used for embryo cultures in human IVF. The amino acid concentrations of most these media are the concentrations set by Dr. Eagle on the basis of somatic cell requirements such as HeLa cells and L cells in 1959, which don't reflect the requirement of embryos. This may have caused to limit the ability of human embryos in vitro. Efficacy of media composed of amino acid concentrations of human oviductal fluid has yet to undergo analysis because there is no medium with the amino acid concentrations similar to human oviductal fluid. In this study, we confirm whether human oviductal amino acid medium is more effective in human IVF compared with current single step medium.

DESIGN: randomized control study.

MATERIALS AND METHODS: Human oviductal fluid samples were collected laparoscopically from 28 women aged 26-39 years, and were analyzed in helping to formulate new embryo culture media. In 2017, medium composed of amino acid concentrations of human oviductal fluid has become available in Japan. We conducted an RCT to evaluate the medium using 762 embryos obtained from 212 cycles of patients who underwent IVF or intracytoplasmic sperm injection (ICSI) between September 2017 and February 2018. Before fertilization, the oocytes were divided into two groups: cultures using the new medium composed of human oviductal amino acid (OVIT); and cultures using current medium (CSC). The embryo grade during culture period (day 0 to day 5) and clinical outcome after embryo transfer were compared between OVIT group and CSC group.

RESULTS: Patient characteristics including women's age, men's age, the number of previous IVF-ET failure cycles were not different significantly. The number of embryo which was transferred to the uterus or cryopreserved was larger in OVIT group compared with CSC group (46.0% (247/537) versus 36.3% (195/537), respectively; $P<0.01$). The implantation rate after transfer of vitrified-warmed embryos was higher in OVIT group compared with CSC group (38.5% (35/91) versus 28.9% (22/76), respectively; the difference was not statistically different). The miscarriage rate was 25.7% (9/35) versus 40.9% (9/22), respectively, thus, the on-going pregnancy rate was 28.6% (26/91) versus 17.1% (13/76), respectively; $P<0.05$.

CONCLUSIONS: Medium composed of human oviductal amino acids enhances embryonic ability more than the current single step medium, and it may make a contribution to clinical success in IVF treatment.

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FURTHER STUDIES INTO THE USE OF A MODIFIED SPECIFIC GRAVITY CHAMBER AS A MEANS OF INDUCING A MICROFLUIDIC EFFECT ON EMBRYO GROWTH. A. Branson,[a] C. Wessels,[a] L. Penrose,[b] S. Prien.[c] [a]Animal and Food Sciences, Texas Tech University, Lubbock, TX; [b]Ob/Gyn, Texas Tech University Health Science Center, Lubbock, TX; [c]Ob/Gyn, Texas Tech University Health Sciences Center, Lubbock, TX.

OBJECTIVE: Limited research has suggested that microfluidic culture can enhance embryo development. To date, devices for inducing the effect have proven both expensive and complicated to use. Previous research from this laboratory has suggested that the modified specific gravity device (MSGD), which was designed as a non-invasive means of assessing embryo quality, has the added benefit of inducing a short-term microfluidic effect, which appears beneficial to embryo development. The objective of the present study was to further explore the effect and determine if processing method had any impact embryo outcome.

DESIGN: A laboratory based study on embryo development following exposure to a microfluidic field.

MATERIALS AND METHODS: A series of MSGD were prepared with varying chamber lengths as described in a previous study (33, 66, 99 mm). Sixteen mice were then superovulated using standard techniques to produce single cell embryos/unfertilized oocytes (N=176). The recovered embryos were then randomly assigned to one of four treatments, the three chamber length or a non-dropped control. In a previous study, embryos had been allowed to move through the observation zone (10 mm) by the force of gravity and then the chamber released inducing a mass flow effect (potential excessive shear force). Here embryos were given time to descend the full length of the chamber by gravity alone. Embryos were then placed in standard culture conditions and allowed to develop for 6 days. Embryos were evaluated every 24 hours for growth.

RESULTS: A total of 98 embryos developed past the single cell stage and were used in the final statistical analysis. Embryos were assessed for both cellular divisions and stage of embryo development. Only embryos dropped through the 33 mm chamber appeared to have significantly higher cell numbers than the control embryos at the end of the study ($P < 0.001$). However, as in the previous reported study, embryos exposed to the MSGD of any length demonstrated better development rates to the morula and blastocyst stage than those embryos in the control group ($P < 0.001$).

CONCLUSIONS: As in the previous studies, the MSGD appears to create a microfluidic effect beneficial to embryo development. The effect appeared to be consistent with previous research, indicating that embryos benefit from traversing the MSGD regardless of the speed of decent, suggesting a robustness to the benefit. Further study is needed to determine the mechanisms in play which result in enhanced embryo development.

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PROSPECTIVE OBSERVATIONAL, COMPARATIVE AND VALIDATION STUDY USING A TIMELAPSE MORPHOMETRY MIRI® IMAGING INCUBATOR. A. Picou,[a] K. Cutler,[a] K. Silverberg,[b] M. VerMilyea.[a] [a]Ovation Fertility, Austin, TX; [b]Texas Fertility Center, Austin, TX.

OBJECTIVE: To compare blastulation rates and pregnancy success from embryos cultured in standard "large-box" Sanyo incubators and Miri® TL Benchtop Multi-room Incubators.

DESIGN: An IRB approved prospective observation and validation study in a private reproductive technology program.

MATERIALS AND METHODS: A total of 65 patients consented and were enrolled into the Time-lapse Morphometry Miri® Imaging Incubator (TiMMI) study. Mature eggs were fertilized by ICSI and cultured to the blastocyst stage undisturbed in Continuous Single Culture® (Irvine Scientific) at 37°C in 6% CO_2. A minimum of 4 normally fertilized oocytes was required to maintain eligibility. Patients were randomized into control standard large-box incubators or the Miri® TL. Morphokinetic data was retrospectively evaluated and compared to ploidy status of embryos following PGT-A by NexGen Sequencing. The time points of interest included: time to first cell division (T2), time from 2-cell division to 3-cell (T3) and time to blastulation. Blastocyst formation was defined as an embryo having clear formation of an inner cell mass, scalloped trophectodermal cells and a blastocel cavity of at least 50% of the embryo.

RESULTS: Post-randomization, the control group consisted of 24 patients with 269 zygotes while 451 zygotes from 41 patients were cultured in the Miri® TL. Control zygotes developed into 124 (46%) excellent quality blastocysts while 193 (43%) excellent quality blastocysts were identified in the study group. No significant difference (*p=.3877)* was observed in blastulation rates between incubator types by chi-square analysis. In addition, 43 frozen embryo transfers (13 Control and 30 Study) were performed with no significant difference (*p=.8642)* in pregnancy success, 53% and 56%, respectively. Pregnancy success was marked by positive fetal cardiac activity at 7 weeks gestation. Morphokinetic data was also analyzed by t-test and did not show a significant difference (*p= 0.787)* in division times between aneuploid and euploid embryos.

CONCLUSIONS: Previous studies have shown no difference in blastocyst formation, viability and ongoing pregnancy rates between other commercially available time-lapse incubators and standard large-box incubators[1,2]. We conclude similar observations in this randomized comparative validation study with the Miri® TL Incubator and standard large-box incubators. The Miri® TL provides a novel, safe and non-invasive approach to monitoring the embryos throughout culture. Although blastulation rates, pregnancy success and morphokinetic data in relation to embryo ploidy did not result in significant differences, the added value of time-lapse as a patient engagement tool has yet to be determined.

References: 1. Cruz, M., Gadea, B. et. al. Embryo quality, blastocyst and ongoing pregnancy rates in oocyte donation patients whose embryos were monitored by time-lapse imaging. Journal of assisted reproduction and genetics, *28*(7), pp.569-573. 2. Kirkegaard, K., Hindkjaer, et al. A randomized clinical trial comparing embryo culture in a conventional incubator with a time-lapse incubator. Journal of assisted reproduction and genetics, *29*(6), pp.565-572.

Supported by: ESCO medical provided the Miri®TL Benchtop incubator at no costs for this study. No additional financial compensation was provided to patients or clinic.

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SPERM QUALITY CAN AFFECT THE EMBRYO KINETIC AND THE EMBRYO DEVELOPMENT. D. Agudo. IVF, IVI Madrid, Madrid, Spain.

OBJECTIVE: Time lapse technology is offering a multitude data about kinetics of embryonic development, but few have studied influence of the male gamete in embryonic kinetics. Our main objective is to determine if the seminal quality can affect the morphokinetic variables of human embryos.

DESIGN: Retrospective study in which were included 118 oocyte donation cycles. Two groups of patients were compared. 80 of them (863 oocytes and 719 embryos) were good prognosis patients sperm samples (more than 15 million/ml, more than 30% of motility and more than 4% of normal forms) (group A) and 38 cycles (427 oocytes and 303 embryos) coming from sperm samples from poor prognosis patients (less than 5 million/ml, less than 5% of motility and less than 1% of normal forms) (group B).

MATERIALS AND METHODS: This oocyte donation cycles were incubated in embryoscope. Cellular events studied in this work were described by Meseguer, M. et al 2011, including all cellular divisions until blastocyst stage, appearance and fading of some cellular structures and two cellular events described as cc2 (difference in hours between first and second cellular cleavage) and S2 (difference in hours between second and third cellular cleavage). Data were exported from the embryo viewer data base. SPSS statistical software was used on data analysis.

RESULTS: We found significant differences respecting the time of cell division between our two groups under study (A and B) only in the time of PN appearance, shorter in A group, and longer T9 and TM (morula formation) in A group. Besides, the duration of the third and fourth cell cycles (CC3 and CC4) are shorter in the B group, then, in the B group, the embryos have less time to complete a right interphase and mitosis. We didn't find significant differences when we compared the classical embryo morphology in D2 and D3 of development in both groups, but we found significant differences in the blastocyst expansion in D5 and D6, being higher in the A group. We also found significant differences when we apply the time lapse algorithms that we used in our lab for implantation forecast in D3 and D5 of development, being in a greater degree the A group embryos. Moreover, we subdivided groups A and B into two subgroups respectively. The first subgroup consists of transferred and frozen embryos, and the second consists of discarded embryos. We found statistically significant association in most of the times of cell division, when we compared the two subgroups of the A group, and the two subgroups of the B group, observing a development delay in discarded embryos. Finally when we compared the viable embryos between A and B group, we found significant differences in the T9 (shorter in A group), and in the duration of CC3 and especially CC4, taking more time to complete it in the viable embryos of A group.

CONCLUSIONS: The bad sperm sample quality may induce a lower T9, that point out the beginning of the fourth cell cycle, lower TM that point out, in this study, the beginning of cell compaction, and shorter third and fourth cell cycles, if we compare to embryos coming from good sperm samples quality.

References: Meseguer M, et al. The use of morphokinetics as a predictor os embryo implantation. Hum Reprod. 2011 Oct;26(10):2658-71.

P-619 Wednesday, October 10, 2018 6:30 AM

HUMID VERSUS DRY BENCH-TOP INCUBATOR: A CASE CONTROL STUDY. K. M. Elqusi,[a] A. A. Hussin,[a] H. A. Alkhader,[b] H. Zaki.[c] [a]IVF Laboratory, Ganin Fertility Center, Cairo, Egypt; [b]IVF Lab Director, Ganin Fertility Center, Cairo, Egypt; [c]Ganin Fertility Center, Cairo, Egypt.

OBJECTIVE: To inspect if modifying a dry bench-top incubator into a humid one would improve the preimplantation embryo development in comparison to that of the dry bench-top incubator.

DESIGN: Case controlled study, including 21 couples undergoing ICSI from November to December 2017.A total number of 571 mature oocytes were divided into two groups after sperm injection. The 1st group was dry culture which included 286 oocytes. The 2nd group was the humid culture which included 285 oocytes.

MATERIALS AND METHODS: Sibling oocytes were divided into humid or dry group after Sperm injection and then cultured to day 5-6. In the first group, the oocytes and subsequently the embryos were cultured in a dry chamber of a Miri Incubator(Originally dry incubator; ESCO).Similarly in the second group but humidity was induced with 80 mL of Molecular Biology water (Lonza; Belgium) in a large petri dish. Embryological Parameters were assessed and recorded through 5-6 days culture.

RESULTS: In the dry culture group, 286 MII oocytes from 21 women were cultured inside dry chambers from day 0 to day 5 or 6. In the humid culture group, 285 MII sibling oocytes were cultured in humid chambers from day 0 to day 5 or 6. Humid culture negatively affected the high-quality blastocyst rate as it was significantly lower in the humid culture group (43.5%) than the dry culture group (62.9%) ($P = 0.0032$). However, there were no significant difference in cleavage rate in the humid culture group (75.4%) than the dry culture (78.67%) ($P = 0.3577$), neither was significant difference in blastocyst formation rate in humid culture group (50.23%) than the dry culture Group (55.11%) ($P = 0.3060$).

CONCLUSIONS: Humidification didn't affect fertilization, Cleavage, or Blastocyst formation rates, but there was a significant difference in high-quality blastocyst rate favoring dry culture.

References: Fawzy M, AbdelRahman MY, et al. Humid versus dry incubator: a prospective, randomized, controlled trial. Fertil Steril. 2017 Aug;108(2):277-283.

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A COMPARISON OF PGS EUPLOIDY RATES BETWEEN DAY 5 AND DAY 6 BLASTOCYSTS. G. Abdo,[a] M. R. Goodwin,[a] M. G. Abdo,[a] F. Sharara.[a,b] [a]Virginia Center for Reproductive Medicine, Reston, VA; [b]George Washington University, Washington, WA.

OBJECTIVE: Aneuploidy screening of blastocysts is being used to improve live birth rates and reduce the number of embryos for transfer. A primary observation indicates that embryo culture and developmental speed of blastocyst stage can affect PGS results. The current study tests the hypothesis that faster embryo development and blastocyst formation on day 5 can lead to higher euploidy rate.

DESIGN: A retrospective study of PGS results from blastocyst biopsied on day 5 verses day 6 was conducted to identify differences in euploidy rates in PGS cases.

MATERIALS AND METHODS: A total of 818 blastocyst biopsies (693 day 5 blastocyst biopsies and 125 day 6 blastocyst biopsies) were included in this analysis. Assisted hatching was performed on day 3, and trophectoderm biopsy took place on days 5 or 6. Euploidy and aneuploidy rates, structural segmental abnormal, complex abnormal and no-results rates were