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TABLE 1.

| TABLE 1. | TOTAL | GROUP 1: HSV | GROUP 2: Cryotop | P |
|----------|-------|-------------|------------------|---|
| Patients | 737   | 368         | 369              | .285 |
| Vitrification cycles | 775   | 389         | 386              |     |
| Age (m ± d) | 36.03 ± 3.90 | 36.18 ± 3.92 | 35.88 ± 3.88 | .285 |
| Age (range) | 25-46 | 26-46       | 26-44            |     |
| Oocytes frozen (m;ds) | 4389 (6.67 ± 3.55) | 1980 (5.09 ± 3.09) | 2409 (6.24 ± 4.0) |     |
| Warming cycles | 624   | 354         | 270              |     |
| Oocytes thawed (m;ds) | 2564 (4.12 ± 1.53) | 1469 (4.15 ± 1.65) | 1095 (4.06 ± 1.41) | .096 |
| Oocytes survived (%) | 1835 (71.6) | 1032 (70.3) | 803 (73.3) | .096 |
| Oocytes microinjected (m;ds) | 1386 (2.23 ± 0.89) | 792 (2.25 ± 0.95) | 594 (2.20 ± 0.82) | .320 |
| Normal Fertilization (%) | 1006 (72.6) | 561 (70.8) | 445 (74.9) | .104 |
| Cleaved Embryos (%) | 910 (90.5) | 508 (90.6) | 402 (90.3) | .994 |
| N° Transfer | 545   | 297         | 248              |     |
| Transferred Embryos (m;ds) | 917 (1.69 ± 0.74) | 512 (1.66 ± 0.79) | 405 (1.71 ± 0.69) | .127 |
| Pregnancy/Transfer (%) | 79/248 (31.8) | 79/248 (31.8) | 95/297 (32.0) | .953 |
| Implantation rate | 80/410 (19.7) | 100/512 (19.5) | 100/512 (19.5) | 1.000 |
| Miscarriage rate | 38/174 (21.8) | 17/79 (21.5) | 21/95 (22.1) | .927 |

No statistically significant differences was observed between the two groups in biological and clinical outcomes.

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STATUS QUO – OR IS IT TIME TO RECONSIDER THE VITRIFICATION METHOD RELATIVE TO THE RISK OF EMBRYO DISEASE TRANSMISSION IN CRYOSTORAGE? Mitchel C. Schiewe, Ph.D., H.C.L.D. (ABB),1 Shane Zozula, B.S., T.S. (ABB),1 Nancy L. Nugent, MS,1 James Stachecki, PhD,2 Robert E. Anderson, MD,1 1Ovation Fertility, Newport Beach, CA; 2Innovative Cryo Enterprises LLC, Linden, NJ; 3SCCRM, Newport Beach, CA.

OBJECTIVE: The current global pandemic has triggered concerns regarding the potential infectivity of the SARS-CoV-2 virus to blastomeres known to possess ACE-2 receptors. In 2010, Pomeroy and coauthors reviewed the negligible risks associated with the potential cross contamination of human reproductive tissues, gametes and embryos in cryostorage. The purpose of this investigation is to explore changes in ART lab practices over the last decade that could warrant a reassessment of the latter AAB/CRB embryo cryopreservation guidelines relative to disease transmission potential.

DESIGN: Retrospective analysis of clinical practices that may alter the way we look at acceptable risks in embryo vitrification (VTF) and cryostorage methods. Specifically, we will investigate the effectiveness of a validated closed VTF system relative to zona pellucida (ZP)-intact and non-intact blastocyst cryopreservation. Additionally, we will discuss the merits and need for safer cryostorage systems.

MATERIALS AND METHODS: Human blastocyst were vitrified in a closed, aseptic device system and rapidly-warmed and sucrose diluted using standard procedures. From 2009 to 2012, 90% of all vitrified blastocysts had an intact ZP without the need for pre-VTF collapsing due to the use of I.C.E. (ICE straw; HSV, µS-VF). In the 10L tank, the rise in temperature began <7.9M glycerol/EG). Between 2012-2014 we transitioned into 100% of all embryos experiencing laser ZP ablation and or blastocyst biopsy procedures by 2015. The latter trophoderm-exposed blastocysts were effectively contained in flexipettes which were seal-ed into CBS straws without risk to possible pathogen exposure in liquid nitrogen cryostorage. Chi-squared analysis was used to assess differences (p<0.05) in survival and pregnancy outcome data.

RESULTS: The routine application of ZP-exposed trophoderm and blastocyst biopsy improved (p<0.05) our survival rates from 95% (1066 of 1126 BL) to 99.4% (3352 of 3373 BL) with increased (p<0.05) embryo implantation efficiency (46% vs 69% implantation using 1.91 vs 1.07 (1066 of 1126 BL) to 99.4% (3352 of 3373 BL) with increased (p<0.05) in the tanks. To simulate tank failure, we drilled a 2mm diameter hole in the vacuum valve of each tank. A temperature prove was set in a plastic sleeve of the temperature at which embryos start to get damaged. Before tank failure causes serious damage for embryos and patients. However, there’s no detailed information as to what to do when tanks are damaged. In our previous study, we indicated that a damaged 10L tank can keep freezing for 7-8 hours if it retains a certain level of LN2. In this study, we analyzed the influence of tank capacity on the estimated embryo salvage period in a simulated tank failure.

DESIGN: Prospective experimental trial.

MATERIALS AND METHODS: We prepared 3 tanks of different capacity (XT10, HC20, HC35, Taylor-Wharton, USA). All tanks were filled up to full with LN2. To simulate tank failure, we drilled a 2mm diameter hole in the vacuum valve of each tank. A temperature prove was set in a plastic sleeve of the temperature at which embryos start to get damaged. We measured the temperature and LN2 levels every 15 min for the first hour. Then, they were measured every hour to the until the rise in temperature began. Before the temperature initiated to rise, they were measured every 15 min to until the temperature reached ~80 °C, which is the temperature at which embryos start to get damaged. Before tank failure simulation, temperatures and LN2 level of each tank were measured every 24 hours for 7 days to see the temperature and LN2 volume shift without tank damage.

RESULTS: Speed of LN2 level decrease of the 10, 20 and 35L tank was 4.6, 4.5, and 2.8 cm/h, respectively. The temperature at the start of measurement for all tanks was -196 °C. In the 10L tank, the rise in temperature began when the remaining LN2 level was 1cm. In the 20 and 35L tanks, it began realized by recent tank failure experiments and known catastrophic events. Finally, it is worth noting that embryos vitrified in an insulated straw environment are more resistant to detrimental additive temperature fluxes that can occur under sub-optimal cryostorage handling procedures. So, we ask, is it time to reconsider the status quo of embryo good tissue practices when viral pandemics are a reality?

SUPPORT: NONE

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RESEARCH ON THE RELATIONSHIP BETWEEN THE CAPACITY OF EMBRYO SALVAGE STORAGE PERIOD WHEN TANKS ARE DAMAGED. Manami Irie, B.S.,1 Akari Obashi, B.S.,1 Hiroshi Matsumoto, B.S.,1 Satoshi Mizuno, Ph.D.,1 Ipppei Akezumi, B.S.,2 Isao Tsui, M.D., Ph.D.,3 Aisaku Fukuda, M.D., Ph.D.,1 Yoshiharu Morimoto, M.D., Ph.D.1 1IVF Osaka Clinic, Osaka, Japan; 2astec, Osaka, Japan; 3HORAC Grand Front Osaka clinic, Osaka, Japan.

OBJECTIVE: Keeping liquid nitrogen (LN2) tank properly is extremely important for an ART clinic. As the accident in the U.S. in 2018 showed, a tank failure causes serious damage for embryos and patients. However, there’s no detailed information as to what to do when tanks are damaged. In our previous study, we indicated that a damaged 10L tank can keep freezing for 7-8 hours if it retains a certain level of LN2. In this study, we analyzed the influence of tank capacity on the estimated embryo salvage period in a simulated tank failure.

DESIGN: Prospective experimental trial.

MATERIALS AND METHODS: We prepared 3 tanks of different capacity (XT10, HC20, HC35, Taylor-Wharton, USA). All tanks were filled up to full with LN2. To simulate tank failure, we drilled a 2mm diameter hole in the vacuum valve of each tank. A temperature prove was set in a plastic sleeve of the temperature at which embryos start to get damaged. We measured the temperature and LN2 levels every 15 min for the first hour. Then, they were measured every hour to the until the rise in temperature began. Before the temperature initiated to rise, they were measured every 15 min to until the temperature reached ~80 °C, which is the temperature at which embryos start to get damaged. Before tank failure simulation, temperatures and LN2 level of each tank were measured every 24 hours for 7 days to see the temperature and LN2 volume shift without tank damage.

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No statistically significant differences was observed between the two groups in biological and clinical outcomes.