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MATERIALS AND METHODS: Labeled 0.5 ml straws (Reproduction Resources; Walworth, WI 53184, Catalog #440676), were filled by aspiration to 2 cm height individually with one of four different commercial media: Sperm washing Media (Fujifilm), (Fujifilm, Santa Ana, CA. 92705, Catalog #0985); Sperm Preparation Medium (Origio). (Origio, Trumbull, CT 06611, Catalog #0169006060D); SAGE QUINN’S Sperm Washing Medium (Sage), (Cooper Surgical & Genomic Solutions, Denmark, Catalog #ART-1006); and Multipurpose Handling Medium with SSS (MHM), Fujifilm, Santa Ana, CA. 92705, Catalog #90163). These four straws were dipped into just below the surface of 18 different ejaculates and held vertically for 30 minutes.

RESULTS: The sperm qualities recovered in the 0.5 mL straws were statistically analyzed using ANOVA, and the mean and standard deviation (SD) of the results are listed in Table 1.

TABLE 1. Mean ± SD Sperm Quality Recovered in the 0.5 mL Straws*  

| Commercial Medium | Median Sperm Concentration x 106/ml | Percent Sperm Motility (%) | Percent Progressive Motility (%) |
|-------------------|-----------------------------------|-----------------------------|---------------------------------|
| Fujifilm          | 11.6 ± 7.9                        | 77.7 ± 16.6                 | 64.8 ± 18.7                     |
| Origo             | 9.1 ± 8.6                         | 83.1 ± 15.0                 | 69.4 ± 19.7                     |
| Sage              | 8.5 ± 5.3                         | 78.7 ± 14.5                 | 63.4 ± 16.2                     |
| MHM               | 11.2 ± 10.5                       | 81.5 ± 12.2                 | 65.3 ± 16.9                     |

*Mean ± SD of Sperm Concentration (98.5 ± 24.7 x 106/ml), Sperm Motility (60.3 ± 13.0%) and Progressive Sperm Motility (40.7 ± 15.6%) of 18 ejaculates.

CONCLUSIONS: There was no statistically significant difference in the quality of sperm recovered in the straws. However, an observable difference in the recovered sperm concentration median value among the four media was noted (Table 1). Future studies may confirm the differences in the response of the sperm from different ejaculates to penetrate and migration through the various sperm media.

IMPACT STATEMENT: Efficacy of four commercial sperm processing media were not significantly different.

SUPPORT: None

P-422 6:30 AM Wednesday, October 20, 2021

A RAPID QC TESTING PLATFORM USING FROZEN SEMEN. Sam D. Prien, PhD, Lindsay L. Penrose, PhD Texas Tech University Health Sciences Center, Lubbock, TX.

OBJECTIVE: The last twelve months have presented significant challenges for the ART laboratory. Mandatory shutdowns, lack of patient access, supply chain issues, and changing rules and recommendations brought on by COVID-19 have stretched laboratories to their limits in an attempt to maintain regular and required activities. One area of concern in the laboratory has been the lack of available fresh semen (FS) samples at the proper times for quality control (QC) and proficiency testing (PT). Cryopreserved semen (CS) would appear a reasonable alternative. However, the quality of CS is known to deteriorate much faster than FS, even in favorable culture conditions. The goal of the present study was to determine, given the proper times for quality control (QC) and proficiency testing (PT). Cryopreserved semen (CS) would appear a reasonable alternative. However, the quality of CS is known to deteriorate much faster than FS, even in favorable culture conditions. The goal of the present study was to determine, given the proper times for QC and PT testing using CS.

MATERIALS AND METHODS: Using materials of known quality from previous PT challenges, 7 commercial donor semen samples were thawed and prepared for quality control and proficiency testing as follows. Samples were thawed using bank-specific protocols. Each thawed sample was split in half and prepared using an IU1 wash protocol with the assigned PT challenge media, either tainted or un-tainted. Once prepared, samples were maintained at 37°C, room air, and 95% relative humidity. Starting at 0 hrs, the samples underwent a semen analysis hourly using an IVOS semen analyzer for a minimum of 6 hrs or until one sample in the pair reached 0% motility after the 6 hr time-point. The resulting data were compared using a paired student’s T-test. Further, results were compared with reports from laboratory PT to verify the efficacy of using frozen semen.

RESULTS: As expected semen parameters decreased over time regardless of treatment (P < 0.001). No pair of samples lasted more than seven hours of incubation. While sperm in the non-tainted media maintained at least 60% of its initial motility at 3 hrs (range 64-91%), none of the cells in the tainted media had more than 50% motility at that time point (range 12-43%; p < 0.001). Further by six hours, all but one of the seven samples in the tainted media had 0% motility (range 0-4%), while six of seven samples in the non-tainted media still maintained a minimum of 25% of their initial motility at thaw (22-37%; P < 0.001). Further, all samples correlated with previous PT results.

CONCLUSIONS: The data suggest it is possible to perform a rapid sperm QC assay using CS. Having a secondary QC protocol would not only provide an alternative when fresh semen, mice embryos, or other methods are unavailable, it would also potentially allow for more standardized methods of QC and PT testing.

IMPACT STATEMENT: The past twelve months have taught that unexpected and uncontrollable events can disrupt routine procedures. Sperm QC assays, which are the mainstay for QC and PT in many andrology laboratories, are dependent on the availability of fresh semen. If a standardized CS method can be created, QC and PT could be done at the convenience of the lab without sacrificing quality or patient safety.

SUPPORT: None

P-423 6:30 AM Wednesday, October 20, 2021

THE EFFICACY OF PHYSIOLOGICAL SPERM SORTING IN ADDITION TO MORPHOLOGICAL SORTING. Hideyuki Ito, M.S., Yukiko Takahashi, M.S., Hiroko Harada, M.D., Mariyo Nakata, M.D., Shuichi Ono, M.D., Takashi Abe, M.D., Ph.D. Shinjuku ART Clinic, Tokyo, Japan.

OBJECTIVE: Selection of spermatozoa is one of the most important factors that influence embryonic development and clinical outcome in intracytoplasmic sperm injection (ICSI). Intracytoplasmic morphologically selected sperm injection (IMSI) is a technique that selects spermatozoa only according to their morphological features under high magnification. However, there is another sperm selection technique that uses hyaluronic acid (HA) to select physiologically mature spermatozoa (HA-ICSI).

The purpose of this study is to investigate the efficacy of physiological sperm sorting in addition to morphological sorting, and how this could contribute to subsequent embryonic development and clinical outcomes.

MATERIALS AND METHODS: Study 1: A total of 658 mature (MII) oocytes derived from large follicles obtained under letrozole cycle were enrolled between April 2017 and May 2020. Sperm sorting using HA was performed with SpermSlow™ (ORIGIO).

The normal fertilization rates, abnormal fertilization rates, egg degeneration rates, cleavage rates, blastocyst formation rates, blastocyst freezing rates, and good quality blastocyst rates at freezing were compared between the two groups (339 oocytes in the IMSI group (April 2017 to April 2018) and 319 oocytes in the HA-IMSI group (April 2018 to May 2020)).

Study 2: Clinical pregnancy rates (CPR), live birth rates (LBR), and abortion rates of day 2 fresh cleavage stage embryo transfer (d2ET) were compared between the IMSI group and the HA-IMSI group. A total of 128 patients (age 34–40 years) out of 225 patients (age 37.1 ± 4.1 years) who underwent d2ET of their first treatment cycle between January 2017 and December 2019 were enrolled. Written informed consent was obtained from all participants.

RESULTS: Study 1: The blastocyst freezing rates of participants that were <40 years of age was significantly higher in the HA-IMSI group (73.3% vs. 58.0%, p < 0.05) than in the IMSI group. The rates of egg degeneration of participants that were >40 years of age was significantly lower in the HA-IMSI group (0.7% vs. 5.2%, p < 0.05) that in the IMSI group. Other parameters also showed favorable trends in the HA-IMSI group, but were not statistically significant.

Study 2: The CPR and LBR were significantly higher in the HA-IMSI group (18.2% vs 34.2%, p < 0.05 14.6% vs 32.9%, p < 0.05) than in the IMSI group. There was no significant differences in abortion rates.

CONCLUSIONS: Blastocyst freezing rates in participants that were <40 years of age was significantly higher in the HA-IMSI group than in the IMSI group, and this suggests that the effect of physiological sperm sorting using HA is more remarkable when the quality of the oocyte is guaranteed.

The physiological sperm sorting positively impacted clinical outcomes.

IMPACT STATEMENT: Physiological sperm sorting in addition to morphological sperm selection during ICSI could contribute to better embryonic development and clinical outcomes.