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O-154 11:30 AM Tuesday, October 19, 2021

ANDROLOGY IN THE ERA OF COVID. 
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OBJECTIVE: The last year has represented a challenging time for andrology laboratories due to the COVID-19 pandemic. Public health guidelines and government regulations intended to reduce the spread of COVID-19 caused a shift in patient practices across healthcare. They impacted the infertility laboratory by changing where and how semen samples are collected. The current study compared the quality of semen being collected for routine semen analysis (SA), and therapeutic IUI cycles, comparing the first year of the pandemic with the previous twelve-month period in a regional fertility center.

MATERIALS AND METHODS: Institutional rules, public health guidelines, and government regulations required the majority (> 98%) of semen samples collected at a regional fertility center to be collected off-site starting March 18th, 2020. The center serves a catchment basin of approximately 300 miles in diameter, meaning some patients might travel for 1-2 hrs to deliver samples collected at home or have to make other arrangements for a collection location closer to the laboratory. To determine what impact the delay in processing and other factors, such as stress, might be having on semen quality, the center conducted a study comparing the standard semen parameters in two arms. The COVID-19 arm were patients seen from March 18th, 2020 to March 17th, 2021, and they were compared to the Pre-COVID-19 arm, who were seen from March 18th, 2019 to March 17th, 2020. Semen Analysis parameters analyzed for all samples included volume, concentration/mL, motility, morphology, total concentration, and total motile concentration. IUI samples were also analyzed for post-wash total concentration and total motile concentration. Resulting Data were compared using student’s T-test.

RESULTS: A total of 423 SA and 378 IUI records were compared. As expected, off-site collection significantly increased the time from collection to completion of the procedure (P < 0.001). Numerous semen parameters of the standard semen analysis were 10-20% lower in the pandemic year when collecting off-site than the same parameter in the 12 months before the pandemic, when on-site collection was used. Focusing on IUI data, the average processing time from collection to finish increased 26 to 48 mins (p < 0.006). Average Total motile sperm has decreased from 49 to 42 million (14%; P < 0.05) between groups. Pregnancy data is pending.

CONCLUSIONS: The pandemic has presented challenges to all reproductive centers. The challenges appear to have had a negative effect on the overall semen quality of patients. While it is unclear how much of an impact delays in processing are having, the data is highly suggestive they are impacting patient treatment.

IMPACT STATEMENT: While delivery of reproductive health care continued during the pandemic, changes in public health guidelines and governmental regulations have impacted patient care thereby causing a reduction in semen quality. Public health officials and practices may need to reevaluate how semen samples are collected for diagnostics and treatment to mitigate this reduction in quality while maintaining the overall health of patients and staff.

SUPPORT: None

O-155 11:45 AM Tuesday, October 19, 2021

ADVANCING PATERNAL AGE NEGATIVELY IMPACTS ODDS OF LIVE BIRTH IN FRESH EMBRYO TRANSFER CYCLES. 
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OBJECTIVE: To determine the impact of varying paternal age, stratifying for maternal age, on fresh transfer cycle outcomes.

MATERIALS AND METHODS: All IVF cycles between 2013 and 2019 at a single institution were reviewed. Only first autologous cycles were included and cycles utilizing donor sperm were excluded. Female age was dichotomized along the cohort median (37 years) (Female-Young (F-Y): <37 years; Female-Old (F-O): ≥ 37 years). Male age was stratified along the cohort median (38 years) and 90th percentile (48 years) (Male-Young (M-Y): <38; Male-Intermediate (M-I): ≥ 38 & >48; Male-Old (M-O): ≥ 48). Multivariable logistic regression models were adjusted for severe oligozoospermia, surgically retrieved sperm, developmental stage of embryo at time of transfer, and number of embryos transferred.

RESULTS: A total of 6704 couples were included and divided into 6 groupings based on paternal/maternal age groups (F-Y/M-Y: 2288; F-Y/M-I: 750; F-Y/M-O: 97; F-O/M-Y: 679; F-O/M-I: 2310; F-O/M-O: 580). On multivariable logistic regression (see Table), only the F-O/M-O group had lower odds of implantation (adjusted OR 0.66, 95% CI 0.52-0.84) and live birth (adjusted OR 0.59, 95% CI 0.48-0.79) compared to (F-O/M-Y). No significant differences were observed for miscarriage or any F-Y groupings.

CONCLUSIONS: Advanced paternal age of ≥ 48 years of age is associated with lower odds of implantation and live birth rates. This is only apparent in women with maternal age ≥ 37.

IMPACT STATEMENT: The impact of advanced paternal age may compound the known impacts of advanced maternal age when undergoing IVF.

SUPPORT: Nahid Punjani is supported in part by the Frederick J. and Theresa Dow Wallace Fund of the New York Community Trust

O-156 12:00 PM Tuesday, October 19, 2021

UTILIZING SPERMATOZOA WITH THE HIGHEST GENOMIC INTEGRITY ENHANCES ICSI OUTCOME.
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OBJECTIVE: To demonstrate that selecting spermatozoa with the highest genomic integrity enhances ICSI outcomes.

MATERIALS AND METHODS: Over the last 4 years, consenting men undergoing ART provided ejaculates for sperm chromatin fragmentation (SCF) screening before and after density gradient centrifugation (DGC). In a subsequent cycle, this assay was carried out before and after microfluidics sperm selection (MFSS). SCF was assessed by terminal deoxynucleotidyl transferase dUTP nick-end labeling (TUNEL); at least 500 spermatozoa were assessed per sample with a normal threshold of ≤15%.

Ejaculated specimens were analyzed in the standard fashion and used for ICSI after selection by DGC or MFSS. Fertilization and clinical outcome were recorded and compared between sperm-processing methods.

RESULTS: A total of 21 men (43.3±8 years) had an average SCF in their raw semen of 22.1±10%, which decreased to 19.1±7% after DGC. These men underwent 39 ICSI cycles with their female partners (38.0±4 years), achieving a fertilization rate of 57.0% (167/293), an implantation rate of only 5.1% (4/78), and a clinical pregnancy rate (CPR) of 11.8% (4/34), with half resulting in pregnancy loss (2/4).

Subsequently, these couples underwent 26 ICSI cycles with MFSS. The SCF after selection was 1.2±1%, remarkably lower than in the raw specimen (P<0.05). In these cycles, there was an improved fertilization rate of 69.3%

TABLE. Multivariable logistic regression for cycle outcomes based on age groups

|                | F-Y/M-Y (n = 2288) | F-Y/M-I (n = 750) | F-Y/M-O (n = 97) | F-O/M-Y (n = 679) | F-O/M-I (n = 2310) | F-O/M-O (n = 580) |
|----------------|-------------------|-------------------|------------------|-------------------|-------------------|-------------------|
| Positive hCG  | 1.06 (0.89-1.26)  | 1.07 (0.69-1.65)  | ref              | 0.92 (0.77-1.10)  | 0.66 (0.52-0.84)  |
| Biochemical    | ref               | 1.17 (0.85-1.61)  | 1.09 (0.50-2.40) | ref               | 1.08 (0.80-1.46)  | 1.01 (0.68-1.50)  |
| Miscarriage    | ref               | 0.97 (0.68-1.38)  | 0.83 (0.33-2.09) | ref               | 0.88 (0.64-1.20)  | 0.83 (0.54-1.26)  |
| Live birth     | ref               | 0.98 (0.83-1.16)  | 1.08 (0.72-1.65) | ref               | 0.90 (0.74-1.10)  | 0.59 (0.45-0.78)  |

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