with the incidence of membrane resistance (B: -8.7, CI: -16.4 - -1.0, p=0.027). There were no significant influences of other investigated maternal lifestyle factors on oocyte dimorphisms.

CONCLUSIONS: Cigarette smoking and the consumption of refined sugar appear to reduce oocyte quality. Therefore, it would be wise to advise female partners undergoing assisted reproduction treatments to abstain from smoking and consuming sugar to avoid decreased in vitro reproduction outcomes.

SUPPORT: None.

O-40 2:45 PM Saturday, October 17, 2020

INFERTILITY AND ENVIRONMENTAL, CHEMICAL, AND HAZARDOUS EXPOSURES AMONG UNITED STATES VETERANS. Abigail C. Mancuso, MD,[1] Andrea Holcombe, MS, PhD,[2] Michelle A. Mengeling, MS, PhD,[2] Ginny L. Ryan, MD, MA.[3] [1]University of Iowa Hospitals and Clinics Iowa City, IA; [2]Iowa City VA Health Care System, Iowa City, IA; [3]University of Iowa Carver College of Medicine, Iowa City, IA.

OBJECTIVE: To assess the association between infertility and environmental, chemical, or hazardous material exposures among United States Veterans.

DESIGN: Cross-sectional survey study.

MATERIALS AND METHODS: A national sample of female and male US Veterans aged 20-45 completed a computer-assisted telephone interview lasting an average of 1 hour 27 minutes assessing demographics, general and reproductive health, and lifetime and military exposures.

Infertility was defined as unprotected intercourse with a member of the opposite sex, with or without trying to conceive, for >12 months without pregnancy over a lifetime. Participants reporting never having had unprotected intercourse were excluded from analysis.

Logistic regression analysis was used to compare exposures among infertile and non-infertile groups. Odds ratios (OR) with 95% confidence intervals are reported.

RESULTS: 3,018 Veterans participated in this study. After excluding participants never reporting unprotected intercourse (216 women and 201 men), 1,194 women and 1,407 men were included in this analysis with 592 (50%) women and 727 (52%) men meeting the definition of infertility.

Exposures reported to be higher among both women and men meeting the definition of infertility than among those not meeting this definition included polychlorinated biphenyl (PCBs) (4.7% vs. 2.3% exposed in the infertile and non-infertile groups respectively; OR 2.09 (1.09-4.00) for women; 9.5% vs 6.2%; OR 1.59 (1.07-2.37) for men) and sulfur fires (2.2% vs. 0.5%; OR 4.48 (1.27-15.81) for women; 4.0% vs 2.1%; OR 1.98 (1.04-3.77) for men).

Exposures reported to be higher only among women meeting the definition of infertility than among women not meeting this definition were extreme heat (66.3% vs 59.0%; OR 1.37 (1.08-1.74)), chemical weapons (e.g., Sarin gas) (10.7% vs 6.8%; OR 1.63 (1.08-2.46)) and anthrax vaccine (54.2% vs. 45.9%; OR 1.40 (1.11-1.75)).

Exposures reported to be higher only among men meeting the definition of infertility than among men not meeting this definition included exposure to oil well fires (16.8% vs. 11.5%; OR 1.56 (1.15-2.11)), petrochemicals (71.4% vs 64.9%; OR 1.35 (1.08-1.69)), other chemicals (such as solvents, degreasers) (55.3% vs. 49.4%; OR 1.27 (1.03-1.56)), and asbestos (35.4% vs. 28.2%; OR 1.39 (1.11-1.74)).

There were no queried exposures self-reported at higher rates in the non-infertile group.

CONCLUSIONS: During their military service, Veterans commonly experience exposure to chemical, physical, and environmental hazards that may have negative effects on their future reproductive health. Our study found that Veterans reporting at least one episode of 12 months or more of unprotected intercourse without conception over their lifetime were more likely to report exposure to such hazards, especially PCBs and sulfur fires. These data provide evidence of an association between exposures encountered during military service and infertility, and thereby support recent efforts to improve coverage of fertility preservation and fertility treatment for Veterans.

SUPPORT: The research reported here was supported by the Department of Veterans Affairs, Veterans Health Administration, Health Services Research and Development (HSR&D) Service grant IIR 13-294. The content is solely the responsibility of the authors and does not necessarily represent the views of the Department of Veterans Affairs.

O-41 3:00 PM Saturday, October 17, 2020

UNIVERSAL SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 (SARS-COV-2) TESTING IN A NEW YORK CITY REPRODUCTIVE MEDICINE PRACTICE. Pietro Bortoletto, MD, Phillip A. Romanski, MD, Joshua Stewart, M.D., Glenn Schattman, MD, Zev Rosenwaks, M.D. The Ronald O. Perelman and Claudia Cohen Center for Reproductive Medicine, Weill Cornell Medicine, New York, NY.

OBJECTIVE: To describe our single-center experience and results of universal SARS-CoV-2 testing in asymptomatic patients undergoing controlled ovarian hyperstimulation (COH).

DESIGN: Retrospective cohort study conducted at a university-affiliated center.

MATERIALS AND METHODS: On March 21, 2020, New York-Presbyterian Hospital, where our retrieval suite is located, instituted a policy of universal SARS-CoV-2 testing prior to surgical procedures requiring anesthesia. As a result, we began testing all patients undergoing COH for SARS-CoV-2 using reverse transcription-polymerase chain reaction via nasopharyngeal swabs (Roche Cobas 6800). Tests were performed on the morning of cycle start and repeated 24 hours before oocyte retrieval. A positive test at either time point excluded patients from continuing with treatment. During the testing period, all patients and staff were required to wear surgical masks at all times when at our center and consented to symptom and temperature screening at every monitoring visit.

RESULTS: Between March 21 and May 20, 2020, 169 asymptomatic patients underwent nasopharyngeal swabs at cycle start, four of which returned positive for SARS-CoV-2 for a center prevalence of 2.4%. All four patients were asymptomatic at the time of cycle start and were not permitted to begin their COH cycle. One of these patients had previously had a positive PCR swab over 60 days prior and had been symptom-free during this interval. One patient with a negative PCR swab on cycle start subsequently converted to positive 15 days later on her PCR swab prior to retrieval, despite the absence of COVID-19 symptoms. Per our hospital policy, she was not allowed to proceed with oocyte retrieval and was started on a course of daily GnRH antagonist and asked to abstain from intercourse for 14 days. None of the 5 patients went on to develop COVID-19 symptoms following their positive test result. All patients were referred to follow-up with their primary care provider. Prior to returning for further COH treatment, all patients will be required to undergo repeat PCR testing with a negative result.

CONCLUSIONS: While rare, asymptomatic carriers of the SARS-CoV-2 virus were identified for a center prevalence of 2.4% in patients undergoing COH. Despite initial negative PCR testing, patients may convert to positive over the course of a COH cycle and not demonstrate symptoms. Strict personal protective equipment and social distancing use is essential to protect patients and staff alike.

O-42 3:15 PM Saturday, October 17, 2020

EFFECT OF THE EXPOSURE TO FINE INHALABLE PARTICULATE MATTER ($PM_{2.5}$) ON SPERM FUNCTIONAL QUALITY OF MICE. Paula Intasqui, PhD,[1] Letícia Kaory Tamashiro, BSc.,[1] Victor Yuji Yariwake, BSc.,[2] Rosana Xavier Souza, BSc.,[1] Camila Matie Kanashiro, BSc.,[1] Mariana Matera Veras, PhD.[2] [1]Sao Paulo Federal University São Paulo, Brazil; [2]Laboratory of Experimental Air Pollution (LIM05), São Paulo, Brazil.

OBJECTIVE: To evaluate the effect of exposure to pollution (fine inhalable particulate matter - $PM_{2.5}$) from the city of São Paulo on sperm functional quality.

DESIGN: Male isogenic BALB/c mice were used, distributed in two groups, control (n=6) and polluted air (n=8). For the polluted air group, after weaning (21 days), animals were daily exposed to 600 $\mu g/m^3$ of $PM_{2.5}$ for 96 days in an Ambient Particle Concentrator (APC). Control group was simultaneously exposed to filtered air in the APC. On postnatal day 118, animals were sacrificed (isoflurane overdose), body was weighted and the epididymis were collected.

MATERIALS AND METHODS: Sperm obtained from the cauda epididymis were used for the evaluation of motility, mitochondrial activity (DAB staining), acrosome integrity (PNA staining), DNA fragmentation (alkaline comet assay), oxidative stress (DHE staining) and cell viability (PI staining). Groups were compared using an unpaired Student's t test ($p<0.05$).

RESULTS: Groups did not differ regarding body weight, and sperm motility. Furthermore, air pollution did not alter sperm functional quality (Table 1).

CONCLUSIONS: Exposure to high concentrations of $PM_{2.5}$ does not affect sperm motility and functional parameters.

TABLE 1. Body weight and sperm functional quality of mice from the control and polluted air groups. Data are presented as Mean ± Standard Deviation. Groups were compared using an unpaired Student's t test.

	Control (n=6)	Polluted air (n=8)	p
Body weight	29.46 ± 4.82	28.01 ± 0.82	0.50
Motility (%)	51.67 ± 13.66	55.62 ± 18.41	0.67
Intact acrosome (%)	85.33 ± 7.65	81.94 ± 9.08	0.48
Mitochondrial activity			
DAB I (%)	7.08 ± 4.53	9.81 ± 10.19	0.56
DAB II (%)	71.75 ± 11.16	68.44 ± 61.75	0.53
DAB III (%)	20.83 ± 9.31	21.06 ± 11.55	0.97
DAB IV (%)	0.33 ± 0.61	0.75 ± 0.96	0.37
DNA fragmentation			
Comet I (%)	29.83 ± 23.17	35.07 ± 23.16	0.69
Comet II (%)	45.83 ± 10.81	36.36 ± 12.90	0.18
Comet III (%)	17.92 ± 10.88	16.36 ± 9.70	0.79
Comet IV (%)	6.58 ± 9.11	12.14 ± 11.70	0.37
Tail DNA (%)	14.11 ± 12.67	19.82 ± 15.38	0.49
Olive Tail Moment (a.u.)	5.41 ± 5.91	7.27 ± 6.60	0.61
Comet Distribute Moment (a.u.)	50.32 ± 43.00	35.80 ± 4.59	0.48
Oxidative stress			
DHE positive (%)	21.98 ± 19.71	12.63 ± 11.22	0.28
Cell viability			
PI positive (%)	51.47 ± 14.33	47.70 ± 13.74	0.63

DAB (3,3'-diaminobenzidine); DAB I: 100% of mitochondrias stained; DAB II: >50% mitochondrias stained, DAB III: <50% mitochondias unstained, DAB IV: no mitochondrias stained. Comet I: no DNA fragmentation; Comet II: low DNA fragmentation; Comet III: increased DNA fragmentation; Comet IV: high DNA fragmentation. a.u: arbitrary units. DHE (Dihydroethidium) positive: presence of superoxide anion stained with DHE. PI (Propidium Iodide) positive: permeable sperm membranes.

SUPPORT: São Paulo Research Foundation (FAPESP grant number 2019/05879-7).

GENETIC COUNSELING

O-43 2:00 PM Saturday, October 17, 2020

EXPERIENCE WITH CARRIER SCREENING FOR X-LINKED CONDITIONS. Dana Neitzel, MS, CGC, Jocelyn Leahey, MS, CGC, Sienna Aguilar, MS, CGC, Nicole Faulkner, PhD, FACMG, Swaroop Aradhya, PhD, FACMG. Invitae San Francisco, CA.

OBJECTIVE: Current ACOG carrier screening guidelines do not support routine inclusion of X-linked (XL) conditions. There are over 100 known XL conditions. Clinical presentation depends on many variables and males are typically affected while females may show varying symptoms. Despite high *de novo* mutation rates, the identification of carriers for XL conditions is important as females have a 50% chance of transmitting a disease-causing variant. The aim of this study was to determine the carrier frequency of XL conditions identified through routine carrier screening for the purpose of reproductive planning.

DESIGN: Retrospective cohort study of patients undergoing routine carrier screening to determine carrier rates of a subset of XL conditions.

MATERIALS AND METHODS: Carrier screening was performed by next-generation sequencing with full coding sequence and deletion and duplication analysis for up to 301 genes as ordered on 68,100 patients. Twenty-two of the 301 genes were XL. Pathogenic and likely pathogenic variants were reported. Ordering patterns and positive rates for XL conditions were assessed.

RESULTS: Of 68,100 patients, 68% were female and 32% were male. Most orders (87.9%; 59,865) included at least one XL condition, though female orders included XL conditions more often than male orders (91.9% vs 79.4%).

Of the 59,865 orders that include XL conditions, the overall positive rate was 60.9% and of these positives, 1.98% were for XL conditions, giving an overall positive rate for XL conditions of 1.2%. In this dataset, at least one carrier was identified for each of the 22 XL conditions tested.

When stratified by patient sex, 1.3% of females (557/42,572) tested positive for an XL condition, most frequently *G6PD*, *FMR1*, *DMD*, *COL4A5*, and *ABCD1*; 0.95% of males (165/17,293) were positive for an XL condition, most frequently *G6PD*, *FMR1*, *COL4A5*, *DMD*, and *GLA*.

CONCLUSIONS: In this cohort, 88% of all orders included at least one XL condition, indicating that clinicians are regularly ordering XL conditions as part of their routine carrier screening for both male and female patients. One point two percent of individuals were positive for at least one XL condition, and XL conditions together accounted for 2% of all positive results.

The inclusion of XL conditions on a carrier screen is controversial: ACOG does not support it; the line between carrier screening and diagnostic testing may be crossed for male patients who screen positive for variants in XL conditions; and the high *de novo* rate in many of XL conditions may lead to false reassurance after a negative carrier screening result.

However, inclusion of XL conditions in routine carrier screening is common practice. Screening for XL conditions allows patients the opportunity to make informed reproductive decisions about these often severe conditions with high reproductive risks. Additional studies are needed to determine the phenotypes and potential impact associated with males identified with XL conditions in this study.

References: NA

SUPPORT: All authors are employees and stockholders of Invitae.Â

O-44 2:15 PM Saturday, October 17, 2020

FAVORABLE OUTCOMES IN A SUBSEQUENT PGT-A CYCLE FOLLOWING ALL ANEUPLOID BLASTOCYST COHORT. Alyssa Schickedanz, M.S, C.G.C, Diane Klepacka, MS, Annette Matts, MS, Amy Bartoli, MS, Emily Anderson, BS, Mary E. Haywood, PhD, William B. Schoolcraft, MD, Mandy G. Katz-Jaffe, PhD. Colorado Center for Reproductive Medicine Lone Tree, CO.

OBJECTIVE: Preimplantation genetic testing for aneuploidy (PGT-A) has been shown to improve the likelihood of live birth per embryo transfer. However, oocyte aneuploidy is significantly associated with reproductive aging, and the probability of an IVF cycle resulting in a lack of euploid embryos becomes more significant for women of advanced maternal age (>38 years). The aim of this study was to review patient's treatment decisions following an all aneuploid PGT-A cycle to assist in future clinical management and counseling practices.

DESIGN: Retrospective cohort analysis.

MATERIALS AND METHODS: Consecutive, autologous PGT-A cycles that resulted in all aneuploid blastocysts between January 2016 and December 2019 (n=550) were included in this analysis. Individual variable analysis was performed using Wilcoxon rank sum test. Step-wise logistic regression models evaluated whether 12 clinical parameters were predictive of patient treatment decisions including parental ages, prior live birth, BMI, ovarian reserve variables and IVF cycle characteristics. Significance determined at $p<0.05$.

RESULTS: Nearly half of the couples (47.6%) decided to terminate treatment following an all aneuploid IVF cycle. Only a small number of couples pursued donor oocytes for future treatment (7.6%) and a handful naturally conceived (1.5%). The remaining couples (43.3%) pursued a second autologous PGT-A cycle, with 50.4% obtaining ≥ 1 euploid blastocyst. Interestingly, women who chose to stop treatment had significantly more oocytes retrieved ($p<0.05$) but trended towards being less likely to have had prior live births ($p = 0.07$) than women who continued infertility treatment. Other variables, including maternal age, AMH and resting antral follicle count (AFC), were not significantly different. Women with euploid blastocysts following their second IVF cycle were significantly younger ($p<0.001$, OR = 0.84) and had higher AMH ($p<0.05$, OR = 1.25) than women with a consecutive second all aneuploid cycle. Stratification of subsequent euploid frozen blastocyst transfers demonstrated the trend of lower maternal age ($p = 0.06$, OR=0.89), higher AFC ($p<0.05$, OR = 1.06) and more mature autologous oocytes ($p<0.05$, OR = 1.12) in association with a positive pregnancy outcome.