## PREGNANCY LOSS RATES AFTER SINGLE, EUPLOID FROZEN-THAWED EMBRYO TRANSFER IN THE COVID-19 ERA

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OBJECTIVE: Data on the impact of COVID-19 on early pregnancy is extremely limited, and patients and practitioners remain cautious about initiating pregnancy in areas of high SARS-CoV-2 transmission.[1-4] In April 2020, during the peak of the pandemic, the prevalence of COVID-19 among New York State residents was estimated to be 22.7%, consisting largely of asymptomatic infection.[5] If SARS-CoV-2 is pathogenic to early pregnancy, an increase in loss might be expected. The objective of this study is to determine if an increase in early pregnancy loss occurred in patients undergoing single, euploid frozen embryo transfer (FET) during the height of the COVID-19 pandemic

DESIGN: Retrospective cohort study

MATERIALS AND METHODS: The study took place at an academic tertiary care center with offices throughout New York City. All single, euploid FET cycles performed from January-May of 2017-2020 were included. Cycles with FET in 2017-2019 were compared to those with FET performed in the corresponding time period in 2020. Baseline characteristics included age, oocyte age, AMH, BMI, and endometrial thickness. Pregnancy loss rate (PLR), or loss after the presence of serum βhCG ≥2.5 mIU/mL, and clinical pregnancy loss rate (CLR), loss after a gestational sac was seen on ultrasound, were compared between January-May, 2017-2019 and January-May, 2020, in aggregate as well as for each corresponding month individually. Comparative statistics and multivariable logistic regression were used.

RESULTS: 2629 single euploid FET cycles were included in the study: 2070 from Jan-May, 2017-2019 and 559 from Jan-May, 2020. Positive pregnancy rates were 73.7% in January-May, 2017-2019 and 77.6% in January-May, 2020. Baseline characteristics were similar. No differences were seen in PLR or CLR when comparing FET from January-May, 2017-2019 to FET from January-May, 2020. No differences were seen in PLR or CLR when comparing individual months in 2017-2019 to 2020. On multivariable logistic

regression, when controlling for oocyte age, AMH, BMI, and endometrial thickness, FET in January-May 2017-2019 was associated with a higher odds of pregnancy loss compared to January-May 2020 (OR 1.32, 95% CI 1.02-1.73, p=.039). No difference was seen in CLR between these groups (OR 1.34, 95% CI 0.92-1.97, p=.13). No differences were seen in PLR or CLR comparing each month individually in the two time periods.

CONCLUSIONS: This data is reassuring that early pregnancy loss rates were not increased during widespread SARS-CoV-2 transmission. A decrease in PLR in January-May, 2020 compared to prior years might be attributable to patients at increased risk of severe illness from COVID-19 infection who elected against treatment. Universal screening for SARS-CoV-2 was neither available nor recommended for patients with mild symptoms at that time. While this data does not exclude a possible impact of infection on pregnancy loss, it suggests that screening patients for elevated temperature, symptoms, and exposure may be effective in maintaining established early pregnancy success rates. This data may help guide clinics in regions experiencing a surge in virus transmission.

Table 1. Demographic characteristics and pregnancy loss rates among single, euploid FET performed in January through May, 2017-2019 compared to January through May, 2020

|  | Jan-May 2017-2019 | Jan-May 2020 | P value |
|---|---|---|---|
| Age | 36.9 ±4.5 | 36.8 ±4.4 | .60 |
| Oocyte age | 35.1 ±4.6 | 34.9 ±4.5 | .35 |
| AMH | 3.60 ±4.04 | 3.15 ±2.80 | .23 |
| BMI | 24.2 ±4.5 | 24.4 ±4.7 | .34 |
| Endometrial thickness | 9.63 ±2.28 | 9.61 ±2.24 | .77 |
| Pregnancy loss rate | 32.1% (490/1527) | 27.6% (119/431) | .08 |
| Clinical loss rate | 16.5% (205/1242) | 15.0% (55/366) | .50 |

Table 2. Pregnancy loss rate by month of embryo transfer (all loss after positive HCG)

| Month | 2017-2019 | 2020 | P value |
|---|---|---|---|
| January | 30.5% (79/259) | 29.9% (35/117) | .91 |
| February | 27.4% (80/292) | 29.5% (33/112) | .68 |
| March | 31.7% (100/316) | 24.0% (25/104) | .14 |
| April | 31.7% (94/295) | 0% (0/3) | .55 |
| May | 37.5% (137/365) | 27.4% (26/95) | .07 |

Table 3. Clinical pregnancy loss rate by month of embryo transfer (loss after presence of gestational sac)

| Month | 2017-2019 | 2020 | P value |
|---|---|---|---|
| January | 16.7% (36/215) | 19% (19/100) | .62 |
| February | 12.4% (30/242) | 15.1% (14/93) | .52 |
| March | 16.2% (42/259) | 11.2% (10/89) | .26 |

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|---|---|---|---|
| April | 16.6% (40/241) | 0% (0/3) | .58 |
| May | 20.0% (57/285) | 14.8% (12/81) | .29 |

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