Study question: Does recovery from SARS–Corona virus 2 (SARS–CoV-2) infection negatively effect IVF cycle parameters?

Summary answer: Female IVF treatment parameters were comparable to the pre-Covid-19 infection cycle performance. Sperm concentration and motility demonstrated lower mean counts following Covid-19 infection.

What is known already: Corona-virus disease-19 (Covid-19) is a global pandemic caused by SARS–Corona virus 2 (SARS–CoV-2). The virus primarily affects the respiratory system, but other systemic and immune mediated effects have been reported. The spikes of SARS-CoV-2 have strong affinity for the Angiotensin converting enzyme (ACE) 2 receptor, leading to an increased Angiotensin II (Ang II) mediated pro-inflammatory response. ACE2 receptors exist in the human reproductive tract (more in males) and pose a regulatory role together with Ang II. So far, reports have been inconsistent regarding testicular effects. Other implications involving fertility and fertility treatment post infection are scarce.

Study design, size, duration: In this retrospective cohort study, IVF cycle performance was compared before and after Corona-virus disease-19. Patients were included only in cases where an IVF cycle was initiated within 3 months of Covid-19 recovery, between March 2020-December 2020.

Participants/materials, setting, methods: The study was conducted in a University affiliated IVF unit. Post Covid- 19 cycle parameters were compared to previous cycles of the same individual prior to infection. If previous cycles were not available, parameters were compared to non-exposed patients of same age, same treatment and identical indication. Sperm concentration and motility were compared before and after infection. Non exposure was defined by a lack of past Covid-19 diagnosis and a negative PCR throughout the treatment.

Main results and the role of chance: All together, including the matched cycles, we compared 40 cycles which started within 3 months of recovery: 26 fresh stimulation cycles and 14 frozen thawed transfer cycles. In 28 of these cycles the patient could serve as its own control. Mean age for the female partner was 33.2 years ±6.5 years. Eight male partners presented post infection and provided fresh samples for a cycle involving fertilization. We compared stimulation parameters including maximal Estradiol level, stimulation length, FSH dosage, number of oocytes retrieved, fertilization rates, number of embryos created, high quality embryo number and endometrial thickness. All of these were comparable to non-exposed cycles (generalized estimating equations, p values >0.1). No complications were recorded, specifically no thromboembolic events or respiratory complications. A total of 8 patients conceived: 1 was a chemical pregnancy, 1 extra-uterine pregnancy, 3 miscarriages and 3 ongoing, of those 1 was complicated by early bleeding. Male sperm analyses showed a trend towards lower post disease parameters, not reaching a statistical significance: 23mil/ml compared to 13.6 and 20.7% progressive motility compared to 12.3% (p values 0.09 and 0.17, respectively).

Limitations, reasons for caution: Current results are based on a small sample size, still insufficient for deducing definite conclusions or guidelines. Pregnancy outcome following IVF treatment in Covid-19 recoverees should further be studied. By the time of the conference, the number of cases is expected to be significantly higher.

Wider implications of the findings: This study provides preliminary data regarding the effects of SARS-COV-2 infection on IVF treatment outcomes. Despite the small sample size, treatment parameters seem unaffected, however, sperm performance seems to be compromised. Health policy and patients' decisions regarding whether or not to postpone IVF procedures necessitates additional data.

Trial registration number: Not applicable - retrospective

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