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P-164 COVID-19 vaccination does not impair fertilisation outcomes in IVF or ICSI cycles. A retrospective cohort study of patients' cycle outcomes before and after vaccination

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Study question: Does vaccination against Covid-19 affect fertilisation outcomes for patients returning for further IVF/ICSI cycle following vaccination?

Summary answer: Fertilisation outcome and selection of fertilisation method based on semen parameters are not altered after COVID-19 vaccination of both partners.

What is known already: There has been much speculation regarding the impact of the COVID-19 vaccine on fertility in both men and women. While vaccine hesitancy has been high amongst people of reproductive age, there is no current evidence that COVID-19 vaccines impact fertility. However, infection with SARS-CoV-2 virus can cause severe complications in pregnancy. Fertility may also be impacted as suggested by observation of decreased sperm count in some men, presence of SARS-CoV-2 virus in the testicles as well as invasion of SARS-CoV-2 in ovaries, uterus, vagina and placenta.

Study design, size, duration: The study included 89 returning, consenting couples undergoing IVF/ICSI in 2021 at Westmead Fertility Centre soon after receiving their COVID-19 vaccine. The fertilisation method and outcomes were compared to their most recent cycle preceding vaccination (2017-2021).

Participants/materials, setting, methods: Fertilisation method was decided based on semen parameters. Semen ejaculates on the day of oocyte retrieval were assessed according to WHO criteria (5th edition). Conventional IVF was performed for patients with normozoospermic samples above lower reference limits for concentration and motility and ICSI was done in patients falling below these criteria. Fertilisation method and outcomes for IVF and ICSI were compared to the most recent cycle performed prior to either partner receiving their COVID-19 vaccine.

Main results and the role of chance: 89 couples returned for an IVF/ICSI cycle following vaccination against Covid-19. Fertilisation outcomes were not significantly different following COVID-19 vaccination (NS, $p > 0.05$, χ^2). Average fertilisation rate (2PN/MII oocyte) per couple undergoing conventional IVF post-vaccination was $71.9 \pm 1.1\%$ compared to $68.1 \pm 1.1\%$ in the previous cycle (NS), while average fertilisation rate per couple undergoing ICSI post-vaccination was $51.7 \pm 1.2\%$ compared to $47.6 \pm 1.2\%$ pre-vaccination (NS). The average age of women/men at the time of OPU post-vaccination was $36.1 \pm 0.6/38.3 \pm 0.7$ years, compared to $35.3 \pm 0.6/37.5 \pm 0.7$ years in the treatment prior vaccination. In the post-vaccination cycle, 55 patients had normozoospermic samples on the day and underwent conventional IVF (61.8%), while 34 patients underwent ICSI (38.2%). Vaccination against COVID-19 did not affect fertilisation method selection with 82/89 (92.1%) of couples having the same method in pre- and post-vaccination cycles. Fertilisation method was different for seven couples (7.9%), with two choosing ICSI post-vaccination, and five being driven by change in semen parameters. Four couples had ICSI in the pre-vaccination cycle and IVF in the post-vaccination cycle, while one couple had IVF in the pre-vaccination cycle and ICSI in the post-vaccination cycle, all resulting in a non-significantly different fertilisation rate per couple ($70.5 \pm 3.8\%$ post-vaccination compared to $66.7 \pm 3.6\%$ in the pre-vaccination cycle, NS).

Limitations, reasons for caution: The results represent the experience gained from current practice and not of a prospective controlled study. The developmental potential of embryos generated and clinical outcomes were not explored.

Wider implications of the findings: IVF/ICSI fertilisation outcomes are likely not affected by both partners being vaccinated against COVID-19 when considering fertilisation rates, semen characteristics and fertilisation method. This information may assist vaccine hesitant couples of reproductive age in making their choice regarding vaccination.

Trial registration number: 2101-08 QA