

Successful vertical transmission of SARS-CoV-2 antibodies after maternal vaccination

1 | INTRODUCTION

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has resulted in over 120 million cases and nearly 3 million deaths worldwide.¹ The Pfizer-BioNTech (BNT162b2) (Pfizer, Inc) mRNA vaccine was the first to be approved in the United States and received Emergency Use Authorization (EUA) from the Food and Drug Administration (FDA) on December 11, 2020.² Health care workers were prioritized to receive the vaccine, and several women who were pregnant or considering becoming pregnant were faced with the difficult decision to receive the potentially lifesaving vaccine with little data about potential effects to their fetus. The American College of Obstetrics and Gynecology and the Society for Maternal-Fetal Medicine issued a joint statement in December advocating pregnant individuals at high risk for contracting the virus should be able to decide whether they will receive the vaccination during pregnancy.³ Although there remains limited data about adverse effects to the fetus, we report a case of vertical transmission of IgG SARS-CoV-2 antibodies from a vaccinated mother to her son with no evidence of prior infection.

2 | CASE

This is a report of a 33-year-old physician who received both doses of the BNT162b2 SARS-CoV-2 vaccine at 29 0/7 weeks' and 32 0/7 weeks' gestation, respectively. She tolerated both doses well with only mild injection site soreness and general malaise with each. She had spontaneous labor at 38 5/7 weeks and delivered a healthy male infant with positive IgG SARS-CoV-2 antibodies in the umbilical

vein blood sample at the time of birth. The mother also had IgG SARS-CoV-2 antibodies confirmed at the time of birth. She is healthy with no prior medical conditions and one prior term birth. There was no evidence of prior SARS-CoV-2 infection in the mother who had a negative SARS-CoV-2 IgG antibody test before vaccination, and two negative nasal swab PCR tests including one prenatally and at the time of delivery (Table 1).

3 | DISCUSSION

This report of vertical transmission of SARS-CoV-2 antibodies after maternal vaccination is the second known case providing anecdotal evidence supporting the safety and benefit of maternal vaccination.⁴ Several studies have evaluated the potential of vertical transmission of SARS-CoV-2 antibodies after maternal infection.⁵⁻⁷ This includes a recent case series of 6 infants born to mothers with recent SARS-CoV-2 infection demonstrating all children had SARS-CoV-2 IgG and IgM antibodies with no adverse effects noted to date.⁷ This was further described in a recent paper in *JAMA Pediatrics* demonstrating neonatal titers correlate with maternal titers and timing of infection.⁸ Furthermore, a recent *JAMA* article demonstrated the SARS-CoV-2 mRNA vaccines were immunogenic in pregnant patients with positive titers in cord blood and breast milk and T-cell responses to SARS-CoV-2 variants of concern.⁹ Unfortunately, antibody titers were not available for the present case.

Pregnant women contracting SARS-CoV-2 infection are at increased risk of intensive care unit admission, mechanical ventilation, and death compared with age-matched non-pregnant patients.¹⁰ Furthermore, the maternal response to

TABLE 1 SARS-CoV-2 testing

Timing	Sample	Test	Result
4 weeks' prenatal	Maternal nasal swab	SARS-CoV-2 PCR	Negative
12 weeks' gestation	Maternal venous	SARS-CoV-2 IgG	Negative
38 weeks' gestation	Maternal nasal swab	SARS-CoV-2 PCR	Negative
Delivery	Umbilical vein	SARS-CoV-2 IgG	Positive
Delivery	Maternal venous	SARS-CoV-2 IgG	Positive

infection puts the fetus at higher risk of preterm labor and pregnancy loss.¹¹ SARS-CoV-2 vaccination has been demonstrated to protect against severe disease. However, pregnant women were excluded from the vaccine trials so the safety and efficacy of the vaccine in this population remains unknown. Despite the lack of data, several pregnant women have been vaccinated and numerous prospective studies are underway to ascertain the maternal and fetal effects of the SARS-CoV-2 vaccines. However, there is significant variation in vaccination acceptance rate worldwide with a recent study suggesting the lowest acceptance rate in the United States, Russia, and Australia.¹² This report provides data to support maternal vaccination with both maternal and fetal benefits.

KEYWORDS

pregnancy, SARS-CoV-2 Ab, vaccine

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