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Obstetrics

The transfer of vaccine-generated SARS-CoV-2 antibodies into infantile circulation via breastmilk

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Multiple studies have demonstrated the presence of vaccine-generated IgG, IgM, and IgA in breastmilk samples,[1,2] although their protective effect for COVID-19 on the breastfed infant is currently unclear. The present study aimed to investigate the transfer of these antibodies into infantile circulation as a possible mode of transferred immunity.

This was a longitudinal cohort study, including lactating COVID-naive women who received two Pfizer BioNTech (Pfizer) BNT162b2 vaccines with a 3-week interval, and their infants. Blood samples were collected from the mothers before, and 4 and 8 weeks after, the first vaccine. The COVID-naive status was confirmed by the absence of anti-spike (S) antibodies before vaccination. Breastmilk samples were collected 4 and 8 weeks after the first vaccine. One blood sample was collected from the infant 8 weeks after the first maternal vaccine. The study was approved by the local ethical committee (advice number 2801) and written informed consent was obtained from all participants. Anti-S SARS CoV-2 IgG (SARS-CoV-2 IgG II Quant assay; Abbott; cutoff 50 AU/ml) and Anti-S SARS CoV-2 IgM + IgA (COVID-19 ELISA IgM + IgA; Vircell; cutoff 8 O.D.) antibodies were determined, respectively, by a chemiluminescent microparticle immunoassay on the ARCHITECT i System (Abbott) and a manual ELISA, according to the manufacturer's instructions.

Samples were obtained from 12 consecutive white mothers and their infants. The demographic characteristics of all participants are shown in Table 1. The results of the breastmilk and maternal serum samples are shown in Figure S1. We could detect anti-S SARS CoV-2 IgM + IgA antibodies in only one of the 13 infantile serum samples, whereas none contained anti-S SARS CoV-2 IgG above the cut-off specified by the manufacturer.

In this longitudinal cohort study, we could not detect vaccine generated anti-S SARS CoV-2 IgG in serum samples obtained from infants 8 weeks after maternal vaccination. These results argue against substantial transfer of vaccine-generated antibodies into

TABLE 1 Cohort demographic characteristics

Lactating vaccine recipients ($n = 12$)	
Age at first vaccination (median, range)	32.5 years (24–39)
First breastmilk sampling, months after delivery (median, range)	8 m (0–26)
Infants of vaccine recipients ($n = 13$)[a]	
Age at blood sampling	9 m (1–27)
Female sex (%)	31
Additional mode of feeding (%)	
Bottle feeding	7.7
Solid feeding	69
Weight at blood sampling (median, range)	8.02 kg (4.00–14.4)
Length at blood sampling (median, range)	72 cm (53.5–93.5)

[a] Two infants were twins.

infantile circulation by mode of lactation, and are in line with another study which used sampling by dried blood spots on non-specified time points after vaccination.[3] Nevertheless, breastmilk IgG or IgA may be critical for neonatal protection against COVID-19 by means of other modes, such as viral neutralization at local mucosal sites.[4] Given the transplacental transfer of vaccine-generated anti-S SARS CoV-2 IgG, vaccination against COVID-19 during pregnancy is mandatory for the transfer of antibodies into infantile circulation.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest.

AUTHOR CONTRIBUTIONS

BL, MR and JVP designed the study. BL and MR collected the data. JVP analyzed the data and wrote the manuscript, with input from BL and MR.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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