Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

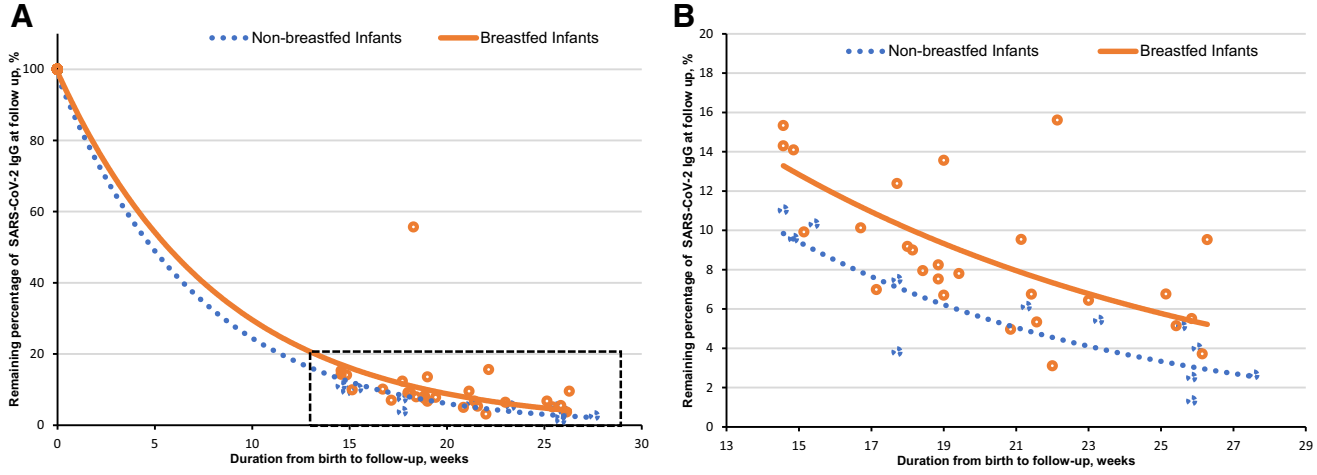
SARS-CoV-2 immunoglobulin G antibody levels in infants following messenger RNA COVID-19 vaccination during pregnancy

OBJECTIVE: Infants are at risk for developing severe COVID-19 illness[1] and are a source of virus spread.[2] Recent studies have demonstrated reduction of SARS-CoV-2 positive tests in infants[3] and COVID-19 infant hospitalizations following maternal COVID-19 vaccination.[4] BNT162b2 (Pfizer/BioNTech) messenger RNA (mRNA) COVID-19 vaccination during the second trimester of pregnancy was associated with high neonatal SARS-CoV-2 immunoglobulin G (IgG) levels at birth.[5] Our aim was to evaluate SARS-CoV-2 IgG levels in infants of up to 6 months of age following maternal vaccination during the second trimester of pregnancy.

STUDY DESIGN: This prospective cohort study, performed between September 2021 and January 2022, included infants at the age of 3 to 6 months of mothers vaccinated with the second BNT162b2 mRNA COVID-19 vaccine. The second dose was received 3 weeks following the first dose according to the standard established for Israel at the time, during the second trimester of pregnancy, and women were not previously diagnosed with COVID-19 (based on self-reported information). All infants had a SARS-CoV-2 IgG antibody level measurement at birth collected by umbilical cord sampling. None of the infants were reported to have a COVID-19 infection during the study period. Following recruitment, we obtained venous blood from each infant, which was assessed by SARS-CoV-2 IgG II Quant (Abbott Laboratories, Chicago, IL), a 2-step chemiluminescent microparticle immunoassay used for the quantitative determination of IgG antibodies. Correlations between infant antibody titers, fetomaternal and infant characteristics, and the time interval from maternal vaccination to the infant follow-up antibody test were analyzed.

RESULTS: Antibody levels were measured for 40 infants. The median (range) level of IgG antibodies at birth was 2790.3 (350.1−13,405.0) AU/mL and declined to a median (range) of 199 (18.4−904.3) AU/mL at a median (range) age of 19.2 (14.6−27.6) weeks. Three of 40 (7.5%) infants had a negative (<50 AU/mL) antibody test at a median (range) age of 26.1 (21.5−26.1) weeks. No differences were found between the different clinical and demographic characteristics of breastfed and nonbreastfed infants. The median (range) level of SARS-CoV-2 IgG levels at follow-up was higher in the 28 breastfed infants (232.0 [105.7−904.3] AU/mL) than in the 12 nonbreastfed infants (145.3 [18.4−575.5] AU/mL) (P=.02). Multivariable analysis revealed that infant SARS-CoV-2 IgG antibody titers at follow-up were positively correlated

FIGURE
Remaining percentage of SARS-CoV-2 IgG antibodies at follow-up in infants



Correlation between the remaining percentage of SARS-CoV-2 IgG antibodies at follow-up and duration from birth for breastfed and nonbreastfed infants. **A,** From 100% SARS-CoV-2 IgG antibodies at birth to remaining percentage at follow-up. **B,** Focus on relevant time period of infant follow-up tests; breastfed infants: r=−0.62; 95% CI, −0.80 to −0.31; P<.001; nonbreastfed infants: r=−0.84; 95% CI, −0.95 to −0.50; P=.001.

CI, confidence interval; *Ig*, immunoglobulin.

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with SARS-CoV-2 IgG levels at birth and breastfeeding, yet negatively correlated with time passed from maternal second vaccine dose. For each week that passed since maternal second vaccine dose, SARS-CoV-2 IgG antibody levels decreased by 5.8% (95% confidence interval [CI], −8.6 to −3.9; $P<.001$). Breastfeeding was significantly and independently associated with higher SARS-CoV-2 IgG levels (absolute difference, 75.1%; 95% CI, 28.4−138.7; $P=.001$). Moreover, the median (interquartile range) remaining percentage of SARS-CoV-2 IgG antibodies from birth to follow-up was significantly higher in breastfed infants than in nonbreastfed infants (8% [6.5−11.8] vs 5.3% [2.9−9.1]; $P=.021$) (Figure).

CONCLUSION: Our findings suggest that maternal COVID-19 vaccination during pregnancy may possibly provide protection from COVID-19 in early infancy, with SARS-CoV-2 IgG antibody levels enhanced by breastfeeding and sustained at least until 6 months of age. ■

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