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Persistence of infection-induced SARS-CoV-2 seropositivity throughout gestation



OBJECTIVE: The SARS-CoV-2 immunoglobulin G (IgG) antibodies increase approximately 2 to 3 weeks after viral infection. The time period for which these antibodies persist and how rapidly they decay have been the subject of several studies in nonpregnant patients, sometimes with differing results.^{1–4} A study in pregnant women observed that the neutralizing antibody titers remained stable throughout gestation.⁵ Our study evaluated the qualitative IgG antibody responses to SARS-CoV-2 infection longitudinally throughout pregnancy in an unselected cohort shortly after the peak of the outbreak in New York to determine the frequency of waning seropositivity.

STUDY DESIGN: This retrospective cohort study evaluated all the patients who had first and second trimester biochemical screening to detect fetal aneuploidy between May 2020 and June 2020 at 3 hospitals within a large integrated health system in New York and subsequently had SARS-CoV-2 antibody testing during hospitalization for delivery. During the study period, the health system policy was to perform SARS-CoV-2 polymerase chain reaction testing on all the hospitalized obstetrical patients and to offer, but not require, SARS-CoV-2 antibody testing. All the included patients were pregnant at the start of the COVID-19 pandemic and delivered before the availability of the SARS-CoV-2 vaccination. For each included patient, the dried blood specimens collected in the first trimester and the serum blood specimens collected in the second trimester were retrieved from storage at -20°C and were tested for SARS-CoV-2 IgG antibodies to the nucleocapsid protein using an enzyme-linked immunosorbent assay (Gold Standard Diagnostics Inc, Davis, CA). The Elecsys Anti-SARS-CoV-2 immunoassay (Roche Diagnostics International Ltd, Rotkreuz, Switzerland) was used to detect the IgG antibodies against the spike

protein for the specimens collected during the delivery hospitalization. The laboratory technicians who performed the immunoassays on the first and second trimester specimens were blinded to the results of antibody testing at delivery. The medical records were reviewed to obtain the clinical characteristics. The descriptive statistics were used to evaluate the data. The institutional review board approved the study protocol.

RESULTS: A total of 149 patients were included for analysis. None of these patients were characterized as chronically immunosuppressed (eg, being associated with HIV/AIDS, organ transplantation, autoimmune disorders) and none received long-term immunosuppressive medications such as corticosteroids during pregnancy. The overall seropositivity ranged from 12.1% to 16.1% in each trimester. Of the 18 patients with detectable SARS-CoV-2 IgG antibodies in the first trimester, 12 (66.7%) remained seropositive at delivery. Of the 24 patients with detectable SARS-CoV-2 IgG antibodies in the second trimester, 7 (29.2%) remained seropositive at delivery. Of the 21 patients who were positive at delivery, 15 (71.4%) were positive in the first, second, or both the trimesters. Of this group ($n=15$), 4 (26.7%) were positive in both the first and the second trimester, 8 (53.3%) were positive only in the first trimester, and 3 (20.0%) were positive only in the second trimester. On the basis of the chart review from delivery hospitalization, only 1 patient reported symptomatic COVID-19. The results are presented in the [Table](#).

CONCLUSION: One-third of the patients who tested positive for SARS-CoV-2 IgG in the first trimester and two-thirds of those who tested positive in the second trimester did not

TABLE
SARS-CoV-2 seropositivity throughout gestation

IgG result	Timing of SARS-CoV-2 antibody test		
	First trimester ^a (n = 149)	Second trimester ^a (n = 149)	Delivery (n = 149)
Positive	18 (12.1)	24 (16.1)	21 (14.1)
Positive at delivery	12/18 (66.7)	7/24 (29.2)	—
Negative at delivery	6/18 (33.3)	17/24 (70.8)	—
Negative	130 (87.2)	122 (81.9)	128 (85.9)
Equivocal	1 (0.7)	3 (2.0)	0

Data are number (percentage).

IgG, immunoglobulin G.

^a The first and second trimester blood samples were obtained at 11 to 14 weeks and 15 to 20 weeks of gestation, respectively.

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have detectable IgG antibodies when admitted for delivery. These findings differ from those of Cosma et al⁵; this may be attributable to the higher proportion of symptomatic patients evaluated in that study. Positive first and third trimester antibody testing with a negative second trimester result may be attributable to test limitations, sample degradation, or reinfection. Antibodies that target the receptor binding domain of the spike protein of SARS-CoV-2 are associated with neutralization, reducing the risk of reinfection. Asymptomatic or mild SARS-CoV-2 infection is associated with lower peak antibody titers.⁶ Waning antibody levels during pregnancy may render patients susceptible to reinfection. For the patients who cite past infection as a justification to defer vaccination, this may be an important talking point, as higher antibody titers are generated after vaccination than after natural infection.⁷ However, it must be acknowledged that antibody response alone may not be the best measure of immunity; memory B cells and T cells may persist and offer some protection against reinfection, even if the serum antibody levels are undetectable.⁸ Our study is limited by the use of multiple laboratory testing methods, lack of quantitative antibody titers, use of stored specimens, a small sample size, potential for selection and recall bias, and an uncertain severity of disease among those with positive antibody testing. Furthermore, the lower level of detection for these qualitative antibody assays is unknown; they are not calibrated to a particular titer cutoff, and the manufacturer-reported sensitivities are based on the precise timing after symptom onset or polymerase chain reaction-confirmed infection, which are not known in this study. Thus, definitive conclusions about the presence or persistence of immunity cannot be made. ■

Cara Staszewski, MD
 Division of Maternal-Fetal Medicine
 Donald and Barbara Zucker School of Medicine at Hofstra/
 Northwell
 Hempstead, NY
 Division of Maternal-Fetal Medicine
 North Shore University Hospital
 Northwell Health
 300 Community Drive, 3-Levitt
 Manhasset, NY 11030
cstaszewski@northwell.edu

Burton Rochelson, MD
 Division of Maternal-Fetal Medicine
 Donald and Barbara Zucker School of Medicine at Hofstra/
 Northwell
 Hempstead, NY

David A. Krantz, MS
 Eurofins NTD Labs
 Melville, NY

Rachel P. Gerber, MD
 Hannah Juhel, BA
 Shreya Reddy, BS
 Matthew J. Blitz, MD, MBA
 Division of Maternal-Fetal Medicine
 Donald and Barbara Zucker School of Medicine at Hofstra/
 Northwell
 Hempstead, NY

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Penetrative genital pain in transgender men using testosterone: a survey study



OBJECTIVE: The American College of Obstetricians and Gynecologists has urged general gynecologists to become competent in caring for female-to-male transgender individuals and has also published guidelines.¹ The specific

introital effects of a dominant testosterone milieu in transgender men have been studied incompletely, but there is some recognition that gender-affirming hormone therapy suppresses estrogen production and has a high likelihood of