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Correspondence

Racial-ethnic disparities and pregnancy outcomes in SARS-CoV-2 infection in a universally-tested cohort in Houston, Texas

Dear Editor,

Hispanic and Black communities are disproportionately affected by coronavirus disease 2019 (COVID-19) [1]. Emerging U.S. data suggest that in pregnancy, Hispanic people are diagnosed with SARS-CoV-2 infection at higher rates than other racial-ethnic groups [2]. Existing reports are primarily limited to case series of symptomatic individuals, which are prone to selection bias, while the few cohort studies reporting on pregnancy outcomes include relatively small numbers of Hispanic people [3]. Contemporary data from representative populations in high-incidence areas are urgently needed. We examined risk factors for SARS-CoV-2 infection and pregnancy outcomes in a universally-tested obstetric cohort admitted for delivery at a community hospital serving a diverse and predominantly Hispanic population.

Table 1
Characteristics and perinatal outcomes by SARS-CoV-2 status.

Characteristic, No. (%)	SARS-CoV-2 positive (n = 77)[a]	SARS-CoV-2 negative (n = 858)	p value
Maternal age > = 35, years	8 (10 %)	127 (15%)	0.291
Race/ethnicity			
Hispanic	56 (73 %)	471 (55%)	0.015
Non-Hispanic White	1 (1%)	26 (3%)	
Non-Hispanic Black	6 (8%)	119 (14%)	
Non-Hispanic Asian	1 (1%)	83 (10%)	
Other/Unknown	13 (17%)	159 (19%)	
Public Insurance	73 (95%)	699 (81%)	<0.001
Nulliparous	20 (26%)	291 (34 %)	0.157
Maternal medical comorbidities	54 (70%)	573 (67 %)	0.550
Obesity (BMI> = 30)	45 (59%)	477 (56 %)	0.565
Hypertensive disease[b]	18 (23%)	149 (17 %)	0.187
Diabetes mellitus[c]	8 (10%)	106 (12 %)	0.614
Asthma	3 (4%)	25 (3%)	0.486
Other[d]	3 (4%)	33 (4%)	>0.99
Preterm delivery (<37 weeks)	5 (6%)	90 (10 %)	0.267
Perinatal death[e]	0 (0%)	7 (1%)	>0.99
Cesarean delivery	21 (27%)	233 (27%)	0.982
Maternal fever, intrapartum or postpartum	6 (8%)	44 (5%)	0.320
COVID-19 symptoms at admission[f]	11 (14 %)	2 (0%)	<0.001
Maternal respiratory support (including oxygen)	3 (4%)	0 (0%)	<0.001
Intensive or intermediate care unit admission[g]	2 (3%)	1 (0%)	0.019
Maternal readmission	1 (1%)	9 (1%)	0.578
Birthweight (median, interquartile range)	3265 (2920–3609)	3220 (2890–3500)	0.328
Neonatal intensive care unit admission[h]	74 (97%)	107 (12%)	<0.001
Neonatal positive SARS-CoV-2 test [i]	1 (2%)	–	–

[a] Includes 6 patients with negative SARS-CoV-2 tests at delivery; 4 who previously tested positive and 2 who subsequently tested positive on postpartum day 2 and 6.
[b] Chronic hypertension, gestational hypertension or preeclampsia.
[c] Pregestational or gestational diabetes.
[d] Any other medical illness or pregnancy complication, e.g. thyroid disease, epilepsy, supraventricular tachycardia, intrahepatic cholestasis of pregnancy.
[e] Includes periviable delivery (n = 4), antepartum fetal death (n = 2), and neonatal death (n = 1).
[f] Symptoms included cough, dyspnea, fever, loss of taste or smell, and sore throat.
[g] Two symptomatic patients were delivered due to severe COVID-19: one had a total length of stay of 9 days (8 postpartum), and one remains hospitalized at a tertiary care center 3 months postpartum continued on ventilatory support after prolonged extracorporeal membrane oxygenation after delivery at 30 weeks. Only one required intubation. No thromboembolic events occurred.
[h] All 71 infants of delivery screening test-positive parents were admitted to the neonatal intensive care unit (NICU) per hospital policy. Infants of parents whose positive tests were antenatal or postnatal remained with their mothers or were admitted to the NICU for clinical reasons.
[i] Among 71 patients whose admission screening test was positive.

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We performed a retrospective cohort study of patients at ≥ 20 weeks of gestation who delivered at a community hospital in Houston, Texas from April 22 through July 22, 2020. Universal SARS-CoV-2 testing (RT-PCR from a nasopharyngeal swab) was performed on patients admitted for delivery using the Abbott ID Now, Hologic Panther Fusion, or Quidel Lyra Direct assay. Patients were evaluated for COVID-19 symptoms, including fever, chills, cough, dyspnea, fatigue, myalgias, loss of taste or smell, sore throat, congestion, and diarrhea.

Neonates of mothers positive for SARS-CoV-2 on admission testing were isolated in the neonatal intensive care unit and tested for SARS-CoV-2 by nasopharyngeal swab at 24 and 48−72 hours of life per hospital policy. Clinical data were abstracted from the medical record. Approval was obtained from the University of Texas Health Science Center at Houston Committee for the Protection of Human Subjects.

Characteristics were compared between patients who tested positive and those who tested negative using χ^2, Fisher exact, or Kruskal-Wallis tests as appropriate. The adjusted relative risk (aRR) of SARS-CoV-2 positivity based on demographic characteristics was assessed using Poisson regression with robust error variance adjusting for variables with $p < 0.1$ in bivariate analysis. Analysis was performed using SAS 9.04. Two-tailed $P < 0.05$ was considered significant.

Of 936 patients who delivered during the 3-month study period, 935 were tested for SARS-CoV-2 and included in the analysis. Overall, 77 (8%) tested positive. Test positivity (7-day average) increased from 3% in April to a peak of 20% by mid-July.

The cohort was 56% Hispanic, 13% Black, 9% Asian, 3 %White, and 18% other/unknown. Compared with non-Hispanic patients, Hispanic patients were more likely to be SARS-CoV-2-positive (10.6% vs 5.5%, aRR 1.73, 95% confidence interval [CI] 1.05–2.85), as were patients with public insurance compared with private (9.5% vs 2.5 %, aRR 3.11, 95 % CI 1.12–8.64; model included ethnicity and insurance). Other baseline characteristics were similar for SARS-CoV-2-positive compared with -negative patients (Table 1). Among SARS-CoV-2-positive patients, 66 (86%) were asymptomatic and 11 were symptomatic (14%). Pregnancy outcomes were similar between groups, including preterm birth and perinatal death. Serious maternal morbidity was rare, and there were no maternal deaths. One neonate (1%) of a symptomatic mother who tested positive for SARS-CoV-2 at 48 h of life remained asymptomatic and was discharged home.

SARS-CoV-2-positive pregnant patients were more likely to be Hispanic and to have public insurance. The majority of pregnant patients diagnosed on admission for delivery were asymptomatic, which is consistent with other universally-tested cohorts, though rates vary [3,4]. Pregnancy complications and perinatal transmission were rare. Our study reports recent outcomes for the largest and most diverse universally-tested obtstetric cohort to date. We acknowledge that a larger sample size is needed to detect differences in uncommon adverse outcomes. The reasons for striking disparities in SARS-CoV-2 incidence are uncertain, however, social determinants of health, including household crowding, occupations in essential services, and barriers to care that are more likely to disadvantage minority pregnant people are potential underlying causes [5].

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Beth L. Pineles
Department of Obstetrics, Gynecology & Reproductive Sciences, McGovern Medical School at The University of Texas Health Science Center at Houston, 6431 Fannin St., MSB 3.286, Houston, TX 77030, United States

Isabella Ciuffetelli Alamo
Nihan Farooq
Jessica Green
McGovern Medical School at The University of Texas Health Science Center at Houston, 6431 Fannin St., MSB 3.286, Houston, TX 77030, United States

Sean C. Blackwell
Baha M. Sibai
Jacqueline G. Parchem*
Department of Obstetrics, Gynecology & Reproductive Sciences, McGovern Medical School at The University of Texas Health Science Center at Houston, 6431 Fannin St., MSB 3.286, Houston, TX 77030, United States

* Corresponding author.
E-mail address: jacqueline.g.parchem@uth.tmc.edu (J. Parchem).

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