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Beth L. Pineles

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Isabella Ciuffetelli Alamo, Nihan Farooq, Jessica Green

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Racial-Ethnic Disparities and Pregnancy Outcomes in SARS-CoV-2 Infection in a Universally-Tested Cohort in Houston, Texas

Beth L. Pineles, MD, PhD¹; Isabella Ciuffetelli Alamo, BA²; Nihan Farooq, MBBS²; Jessica Green, BSA²;
Sean C. Blackwell, MD¹; Baha M. Sibai, MD¹; Jacqueline G. Parchem, MD¹

Author Affiliations:

¹ Department of Obstetrics, Gynecology & Reproductive Sciences, McGovern Medical School at The University of Texas Health Science Center at Houston, Texas; 6431 Fannin St., MSB 3.286, Houston, TX 77030

² McGovern Medical School at The University of Texas Health Science Center at Houston, Texas; 6431 Fannin St., MSB 3.286, Houston, TX 77030

Corresponding Author:

Jacqueline G. Parchem, MD

Division of Maternal-Fetal Medicine

Department of Obstetrics, Gynecology and Reproductive Sciences

McGovern Medical School at The University of Texas Health Science Center at Houston

6431 Fannin St., MSB 3.286

Houston, TX 77030

Phone: (713) 500-5176; Fax: (713) 500-0799

Email: jacqueline.g.parchem@uth.tmc.edu

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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.

We performed a retrospective cohort study of people ≥ 20 weeks of gestation 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 people admitted for delivery using the Abbott ID Now, Hologic Panther Fusion, or Quidel Lyra Direct assay. People 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 parents 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 people 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 people delivered, 935 were tested for SARS-CoV-2 and included in the analysis. Overall, 77 (8%) people 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 people, Hispanic people 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 people 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 people (Table). Among SARS-CoV-2-positive people, 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 hours of life remained asymptomatic and was discharged home.

SARS-CoV-2-positive pregnant people 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 cohort of pregnant people 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)

Sincerely,

Beth L. Pineles, MD, PhD¹

Isabella Ciuffetelli Alamo, BA²

Nihan Farooq, MBBS¹

Jessica Green, BSA²

Sean C. Blackwell, MD¹

Baha M. Sibai, MD¹

Jacqueline G. Parchem, MD¹

Declaration of interests

☒ 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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Table. 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 (7%)	90 (11%)	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 people 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 people 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 parents or were admitted to the NICU for clinical reasons

ⁱ Among 71 people whose admission screening test was positive