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Research Letter

Preterm Birth During the Coronavirus Disease 2019 (COVID-19) Pandemic in a Large Hospital System in the United States

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INTRODUCTION

Denmark and Ireland have reported drastic reductions in the rate of preterm birth during the coronavirus disease 2019 (COVID-19) global pandemic,[1,2] though this was not found in the United Kingdom.[3] These findings have led to widespread speculation, both in the academic and lay press, that the acts of social isolation and quarantine may lead to a reduction in the incidence of preterm birth.[1–4] We investigated whether our hospital system in the United States had any change in the preterm delivery rate during the peak COVID-19 pandemic era when compared with the pre–COVID-19 era.

METHODS

We compared singleton live births at 20 weeks of gestation or greater during the peak COVID-19 pandemic era (April through July of 2020, during the statewide recommended "stay-at-home" order in Massachusetts) with those in a pre–COVID-19 era (April through July 2019). We included four hospitals within our hospital system, all with level 3 or 4 neonatal intensive care units (two large academic teaching hospitals and two community-based hospitals), excluding women who were already at 37 weeks of gestation or greater at the start of the time period. Data were abstracted from the electronic medical record. Race and ethnicity were self-reported in electronic medical record patient demographics. We looked at the overall gestational age distribution during the peak of the COVID-19 pandemic era and the pre–COVID-19 era, as well as the rate of preterm birth using various thresholds. This study was approved by the Mass General Brigham Institutional Review Board.

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RESULTS

Our cohort included 9,356 deliveries: 4,644 in the pre–COVID-19 pandemic era and 4,712 during the peak COVID-19 pandemic era. The distribution of gestational ages was identical in the two eras (median gestational age at delivery 39 2/7 weeks in both). There was no difference in the overall rate of preterm birth at less than 37 weeks of gestation (7.4% vs 7.9%; P=.4), nor any differences in the rate of delivery at less than 34, less than 32, or less than 28 weeks. There was no difference in spontaneous compared with iatrogenic preterm birth (56.1% of preterm deliveries in 2019 were spontaneous vs 54.6% in 2020; P=.7). In a post hoc power calculation, we had 80% power to detect a 20% reduction in the overall rate of preterm birth. In the peak COVID-19 pandemic era, 158 (3.4%) deliveries were to women who had severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection confirmed by polymerase chain reaction test at any time. Infection was more common in women who were Black (6.7% vs 3.0%; P<.01),

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Table 1. Preterm Birth Before the Coronavirus Disease 2019 (COVID-19) Pandemic (April–July 2019) and During the Peak of the Pandemic (April–July 2020)

	Pre–COVID-19 (n=4,644)	Peak COVID-19 (n=4,712)	P*
Gestational age (wk)	39 2/7 (38 3/7–40 0/7)	39 2/7 (38 3/7–40 0/7)	.8
Preterm delivery (wk)			
Less than 37	344/4,644 (7.4)	372/4,712 (7.9)	.4
Less than 34	83/4,644 (1.8)	97/4,712 (2.1)	.3
Less than 32	46/4,644 (1.0)	62/4,712 (1.3)	.1
Less than 28	14/4,644 (0.3)	20/4,712 (0.4)	.3
Spontaneous preterm birth	193/344 (56.1)	203/372 (54.6)	.7

COVID-19, coronavirus disease 2019.
Data are median (interquartile range) or n/N (%) unless otherwise specified.
* *P* derived from Wilcoxon rank-sum (continuous) or χ^2 (categorical) test.

Hispanic (11.3% vs 1.8%; $P<.01$), and publicly insured (10.7% vs 1.4%; $P<.01$); however, there were no reductions in preterm birth in any demographic subgroup. Results were similar when excluding the 158 women with polymerase chain reaction test–confirmed SARS-CoV-2 infection.

DISCUSSION

We report no reduction in the preterm birth rate at our hospital system in the United States during the COVID-19 pandemic. We had adequate power to detect up to a 20% reduction in preterm birth, far less than the 70–90% reduction seen in Denmark and Ireland.[1,2] There were no differences in transfer or referral patterns for preterm delivery in the two time periods, with more than 90% of transfers occurring from within our hospital system in both. There were no differences in preterm birth type (spontaneous vs iatrogenic), indicating that changes in prenatal care delivery during the pandemic did not alter iatrogenic preterm birth rates. The rate of preterm birth and SARS-CoV-2 infection in the United States and in our hospital system are significantly higher than the rates in the previous international studies, which may in part account for the disparate findings. Our cohort showed Black, Hispanic, and publicly insured women to have higher rates of SARS-CoV-2 infection, consistent with previous findings[5]; however, we did not find any reduction in preterm birth overall or in any demographic groups. Our study findings do not support the theory that quarantine or health care delivery changes during the COVID-19 pandemic decrease rates of preterm birth (Table 1).

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