Journal of Community Health
https://doi.org/10.1007/s10900-020-00940-7

ORIGINAL PAPER

Coronavirus Disease 2019 in Pregnancy: The Experience at an Urban Safety Net Hospital

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Accepted: 21 October 2020

Abstract

Shortly after the identification of a novel coronavirus, the coronavirus disease 2019, or COVID-19, a global pandemic was declared. There have been conflicting data about the severity of COVID-19 disease course in pregnant women, with most US data suggesting an increase in severity and increased need for hospitalization and intubation in obstetric patients. In the general population, the disease is more common among racial and ethnic minority populations, and severity is increased with comorbid conditions and obesity. The purpose of this study is to characterize COVID-19 infection in pregnancy in a population of women getting prenatal care at an urban safety-net hospital. Beginning in April, 2020, all women were tested at admission for delivery, and additionally as an outpatient if presenting with COVID-19 symptoms. In three months, there were 208 discrete women tested and 23 (11.1%) who were positive for COVID-19. The incidence of COVID-19 was 5.1% in asymptomatic women being screened upon admission to the hospital. There was a high prevalence of obesity (68.2%) and other comorbid conditions (43.5%) in this population, and all patients were racial/ethnic minorities. Despite these risk factors, the patients uniformly had either mild or asymptomatic disease. No symptomatic patients required hospitalization for their infection. In this population of pregnant women at high risk for severe COVID-19 infection, only mild disease was observed.

Keywords COVID-19 · Pregnancy · Urban · Comorbid conditions

Introduction

In December 2019 a novel coronavirus outbreak was first reported in Wuhan China, and subsequently the World Health Organization (WHO) declared a global pandemic [1]. The severity of coronovirus disease 2019 (COVID-19) can range from asymptomatic to critical disease.

National data demonstrate a higher prevalence and severity of COVID-19 infection among African American and Latino populations, and this has been confirmed in Chicago [2]. Other risk factors for disease severity include older age, chronic kidney disease, chronic obstructive pulmonary disease, immunocompromise, obesity, cardiovascular disease, diabetes mellitus, and possibly asthma, smoking, and hypertension [3]. There are conflicting data on disease course in pregnancy [4, 5], with obesity and gestational diabetes risks for severe infection in pregnant women [6, 7]. The purpose of this study was to determine the prevalence and disease course of COVID-19 among pregnant women delivering at John H. Stroger Hospital, a safety net hospital in Chicago, Illinois.

Methods

This study received approval from our Institutional Review Board. The study period was from April 12 to July 11, 2020. After April 12, 2020, all pregnant women admitted to Stroger Hospital received a COVID-19 viral test unless they opted out. In the outpatient setting, women with COVID-19 symptoms or within 48 hours of an elective admission were tested. The departmental obstetric quality assurance database and electronic health record were reviewed to obtain basic demographics, disease course (as categorized by the WHO and Wu), comorbid conditions, and obstetric/neonatal

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Published online: 31 October 2020

Table 1 Characteristics of women in this study n = 208

Characteristic	Covid positive n = 23	Covid negative n = 185	
Demographics	Mean (range)	Mean (range)	t-test
Maternal age (years)	25.9 (17–38)	28.1 (15–49)	p = 0.049
Gravidity	3.1 (1–8)	2.4 (1–14)	p = 0.40
Parity	1.7 (0–7)	0.8 (0–9)	p = 0.23
Estimated gestational age at diagnosis (weeks)	33.2 (17–40)	37.1 (15–41)	p = 0.002
Estimated gestational age at delivery (weeks)	37.9 (29–40)	39.8 (15–41)	p = 0.31
BMI* (kg/M^2)	33.5 (21–48)	32.9 (20–68)	p = 0.48
Race/ethnicity	N (%)	N (%)	κ^2
African American	11 (47.8%)	94 (50.8%)	p = 0.79
Latina	12 (52.2%)	72 (38.9%)	p = 0.22
White	0	10 (5.4%)	
Asian	0	5 (2.7%)	
American native/Alaskan native	0	4 (2.2%)	
Comorbid conditions (may have more than one)			
Obesity (BMI≥30)	15 (68.2%)	112 (60.5%)	p = 0.66
Diabetes type I/II	2 (8.7%)	8 (4.3%)	p = 0.36
HIV seropositive	2 (8.7%)	4 (2.2%)	p = 0.08
Hypertension	4 (17.4%)	25 (13.5%)	p = 0.62
Asthma	4 (17.4%)	24 (13.0%)	p = 0.59
Syphilis	1 (4.3%)	3 (1.6%)	p = 0.37
Thrombocytopenia < 105,000	3 (13.0%)	3 (1.6%)	p = 0.002
Pregnancy related conditions			
Gestational diabetes	1 (4.3%)	11 (5.9%)	p = 0.77
Pregnancy induced hypertension	2 (8.7%)	45 (24.3%)	p = 0.096
Cholestasis of pregnancy	2 (8.7%)	4 (2.2%)	p = 0.08
Small for gestational age	1 (4.3%)	6 (3.2%)	p = 0.78
Symptoms			
Asymptomatic	10 (43.5%)		
Cough	7 (30.4%)		
Fever	5(21.7%)		
Sore throat	3 (13.0%)		
Gastrointestinal	3 (13.0%)		
Anosmia/loss of taste	5 (21.7%)		

**BMI* body mass index, *HIV* human immunodeficiency virus

outcomes [8, 9]. Women tested multiple times were only included once from the first time tested.

Results

During the study period, 223 women were offered COVID-19 testing, and three asymptomatic women declined. Of 208 discrete patients tested, 23 (11.1%) were positive, of which 13 (56.5%) were symptomatic. In the 196 tests done in asymptomatic patients, 10 (5.1%) were positive. In the 12 tests done on symptomatic patients, 11 (91.7%) were positive. Of the 23 positive tests, 11 were in African American and 12 in Latina women. In the patients testing positive, 15 (65.2%) were obese defined by body mass index (BMI) ≥ 30, and ten (43.5%) had other comorbid conditions (see Table 1). The most common symptoms were cough, fever, and anosmia or loss of taste. Disease course was mild in all patients, with no need for admission to the intensive care unit or mechanical ventilation. No patients tested in the outpatient setting needed admission for COVID-19-related symptoms.

When comparing COVID-19 positive women to seronegative women, those with infection were significantly younger (p = 0.049) and more likely to have a low platelet count(p = 0.002). There were no White, Asian, or American Native women with COVID-19 in this study. The groups were otherwise similar in composition. Only women with symptoms were tested prior to admission for delivery, so the estimated gestational age at diagnosis was earlier among

women with COVID-19 infection, however women with COVID-19 infection did not deliver significantly earlier.

At this time, 21 COVID-19 positive women have been delivered, all for obstetric indications. Of these, 15 (71.4%) had vaginal deliveries, two were preterm (one with twins, one placental abruption) and one was small for gestational age (maternal cocaine use). There were six cesarean sections, one for non-cephalic twins, one for malpresentation, and four elective repeat procedures. Thrombocytopenia was newly diagnosed in three women, and one previously asymptomatic woman was diagnosed with chorioamnionitis due to an intrapartum fever. All babies whose mothers were COVID-19 positive at delivery tested negative.

Discussion

Of pregnant women receiving their care with Cook County Health and Hospital Systems, 11.1% tested positive for COVID-19, as did 5.1% of asymptomatic women. Although lower than the 13.7% rate reported in New York City [10], this rate is higher than reported in other urban areas [11, 12]. All COVID-19 positive women in this study were either Latina or African American, which is consistent with the racial disparity reported nationally. Almost half of the women in this study had comorbidities, exceeding the 22.9% reported in national data [5, 13]. Although women with COVID-19 infections in this study were more likely to have low platelet counts, this had no clinical significance. Of three women with COVID-19 infection and low platelets, two were asymptomatic and one had mild disease. A meta-analysis of over 7600 patients with COVID-19 infections demonstrated an association between low platelet counts and both severe disease and death [14]. Despite the high rate of chronic illness and obesity, COVID-19 disease course was always mild in this cohort. Consistent with reports in the U.S. and China, neonatal outcomes were good, and all tested babies were COVID-19 negative [15]. In this report of low-income minority women giving birth at a safety net hospital, the diagnosis of COVID-19 was relatively common, and despite a high prevalence of comorbid conditions, disease course was uniformly mild.

Acknowledgements The authors did not receive support from any organization for the submitted work. The authors have no relevant financial or non-financial interests to disclose.

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