

Letters

RESEARCH LETTER

Prevalence of SARS-CoV-2 Among Patients Admitted for Childbirth in Southern Connecticut

Developing an approach to care for pregnancy and childbirth during the coronavirus disease 2019 (COVID-19) crisis is a priority to (1) provide safe care to pregnant women and newborns; and (2) protect health care workers from infection. A study conducted in New York City reported a 13.5% prevalence of asymptomatic infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in women presenting for childbirth.¹ On March 30, 2020, an initially asymptomatic woman admitted to the Yale New Haven Health system developed cough and fever soon after childbirth; testing confirmed SARS-CoV-2 infection. This event prompted the development of a SARS-CoV-2 screening and testing program of patients presenting for childbirth; we report the prevalence detected in the first weeks of the program.

Methods | From April 2, 2020, to April 29, 2020, screening and testing of patients admitted for childbirth was initiated at 3 Yale New Haven Health hospitals in southern Connecticut. Screening consisted of questions related to travel, contacts, and symptoms of COVID-19. All patients without a prior diagnosis of COVID-19 underwent SARS-CoV-2 polymerase chain reaction (PCR) testing of nasopharyngeal swabs, with rapid testing available. Patients scheduled for cesarean birth were screened and tested at preoperative visits.

Hospital policies recommended universal mask use on clinical units by clinicians, patients, and support persons and limited each patient to 1 support person visitor for childbirth. For patients with symptoms of COVID-19, clinicians wore N95 respirators and appropriate personal protective equipment (PPE) until results returned, continuing use for patients with positive test results. For patients without symptoms of COVID-19, clinicians followed usual precautions including wearing masks. For the second stage of labor and cesarean or vaginal birth, clinicians wore full PPE and N95 respirators for patients without test results or with positive tests. Excluded from universal testing were patients already diagnosed with COVID-19 and patients not admitted for childbirth. The numbers of positive PCR tests in patients with and without symptoms of COVID-19 were assessed over time. This quality improvement project does not meet the definition of human subjects research; review by the institutional review board was not required.

Results | Seven hundred eighty-two patients presenting for childbirth were screened; 1.5% (12/782) were previously diagnosed with COVID-19. The remaining 770 patients were tested at admission (Table 1) and 30 of 770 (3.9%) tested positive for SARS-CoV-2 (Table 2). Twenty-two of the 30 who tested positive for SARS-CoV-2 (73.3%) were asymptomatic.

Table 1. Demographics and Characteristics of Patients Tested for SARS-CoV-2 on Admission for Childbirth^a

Characteristics	SARS-CoV-2 PCR result	
	Positive (n = 30)	Negative (n = 740)
Age, y		
<30	14 (46.7)	199 (26.9)
30-34	10 (33.3)	310 (41.9)
≥35	6 (20.0)	231 (31.2)
Nulliparity	16 (53.3)	323 (43.7)
Site of hospital		
Greenwich	8 (26.7)	204 (27.6)
Bridgeport	11 (36.7)	129 (17.4)
New Haven	11 (36.7)	407 (55.0)
Gestation <37 weeks at birth	0	62 (8.4)
Cesarean delivery ^b	10 (33.3)	275 (37.2)
APGAR score		
<7 At 1 minute	0	40 (5.4)
<7 At 5 minutes	0	12 (1.6)
Neonatal birth weight, mean (SD), g	3370 (621)	3331 (568)
Neonatal SARS-CoV-2 positive test result ^c	0	

Abbreviations: COVID-19, coronavirus disease 2019; PCR, polymerase chain reaction; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

^a Data are expressed as No. (%) of participants unless otherwise indicated. Excludes patients diagnosed with COVID-19 prior to admission, including those considered recovered (defined as ≥14 days from onset of symptoms and ≥72 hours afebrile).

^b Mode of birth was determined by routine obstetric indications.

^c Neonatal testing by PCR of nasopharyngeal swabs was performed at 24 hours of age.

The overall prevalence of positive test results among asymptomatic patients was 2.9% (22/756). Prevalence of positive test results among asymptomatic patients increased from 0.6% (2/355) to 5% (20/401) from the first 2 weeks (April 2-15, 2020) to the second 2 weeks (April 16-29, 2020), though the prevalence of symptomatic patients who tested positive in the total population admitted for childbirth decreased from 1.4% (5/365) to 0.7% (3/405) (Table 2). Fifty-seven percent (8/14) of patients with symptoms tested positive. No asymptomatic patients who tested negative developed symptoms or required further testing. No health care workers on the obstetric units were removed from work due to SARS-CoV-2 exposure or disease from transmission from a known or possible contact with a patient.

Discussion | These findings suggest a low (<3%) prevalence of positive SARS-CoV-2 test results among asymptomatic patients in a pregnant population outside of the highly endemic region of New York City. During this time period, these hospitals, with approximately 2200 licensed beds, experienced a peak (April 21, 2020) of 759 patients admitted for COVID-19,

Table 2. SARS-CoV-2 Test Results for Patients Tested at Admission for Childbirth, Stratified by Symptoms^a

Screening characteristic	SARS-CoV-2 PCR result	Patients screened, No. (%) ^b		
		April 2-15, 2020 (n = 365)	April 16-29, 2020 (n = 405)	Total (n = 770)
Asymptomatic	Positive	2 (0.5)	20 (4.9)	22 (2.9)
	Negative	353 (96.7)	381 (94.1)	734 (95.3)
Symptomatic ^c	Positive	5 (1.4)	3 (0.7)	8 (1.0)
	Negative	5 (1.4)	1 (0.2)	6 (0.8)

Abbreviations: COVID-19, coronavirus disease 2019; PCR, polymerase chain reaction; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

^a Excludes patients diagnosed with COVID-19 prior to admission, including those considered recovered (defined as ≥ 14 days from onset of symptoms and ≥ 72 hours afebrile).

^b Percentage is expressed as percentage of total patients tested during the time period.

^c Signs and symptoms of COVID-19 in patients with positive SARS-CoV-2 test results were mild in 7 patients, including fever, headache, rhinorrhea, sore throat, myalgias, congestion, cough, anosmia/ageusia. One patient had severe symptoms, including fever, myalgias, malaise, congestion, and shortness of breath. No mildly symptomatic patients developed COVID-19-related complications. The severely symptomatic patient recovered from respiratory insufficiency with critical care and oxygen support via nonrebreather mask.

and among US states, Connecticut had the 3rd highest death rate per capita from COVID-19, indicating a substantially affected region.² The increasing prevalence of positive SARS-CoV-2 test results in the asymptomatic population, while the prevalence of symptomatic infections decreased, may indicate that universal testing identifies patients in a convalescent period, in addition to those with subclinical active infection. Although performed in mixed community and academic hospital settings, limitations of the findings include a short duration and a single geographic region.

Approaches to care that balance screening and testing of patients combined with a rationalized approach to use of PPE should be considered for obstetric units.

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1. Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery. *N Engl J Med*. Published online April 13, 2020. doi:[10.1056/NEJMc2009316](https://doi.org/10.1056/NEJMc2009316)

2. Connecticut coronavirus map and case count. *New York Times*. Published April 16, 2020 (updated daily). Accessed April 16, 2020. <https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html>