

Clinical Implications of Universal Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Testing in Pregnancy

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INTRODUCTION

Emerging antibody surveillance suggests that many individuals with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection do not manifest clinical symptoms.¹ These findings raise concerns for the safety of health care workers when the SARS-CoV-2 infection status of patients they are caring for is unknown. Published case series from New York City have demonstrated SARS-CoV-2 positivity in pregnant women without any reported symptoms before admission.² These experiences, alongside the unique and prolonged exposure health care workers face when delivering parturients, have led multiple hospitals across the country to implement universal SARS-CoV-2 testing for all women admitted for delivery. The experience of two hospitals, located in the U.S. epicenter of the pandemic, was reported and demonstrated a 13.5% prevalence of SARS-CoV-2 infection among the 211 asymptomatic women tested (Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery [letter]. *New Engl J Med* 2020 Apr 13 [Epub ahead of print]). How these results translate to other areas of the country in varying phases of the pandemic remains unknown.

See related editorial on page 227.

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METHODS

This study was approved by the Northwestern Institutional Review Board before its initiation. At Northwestern Memorial Hospital, which is located in urban Chicago, approximately 12,000 women deliver per year. This is a prospective case series of pregnant women admitted to Northwestern Memorial Hospital from April 8 to April 27, 2020. During this time, Illinois and Chicago were in the acceleration phase of the pandemic, with between 1,100 and 2,700 and 900 and 1,500 incident diagnoses daily, respectively.³ In comparison, New York City was entering into the deceleration phase of the pandemic during this window.⁴

On April 8, 2020, universal testing for SARS-CoV-2 infection was implemented for pregnant women being admitted to Northwestern Memorial Hospital. Women with scheduled admissions were tested 12–36 hours before admission in a designated drive-through testing center using an in-house polymerase chain reaction–based platform with an 8-hour turnaround time. Women with unscheduled admissions underwent testing either in obstetric triage or in their labor and delivery room with a commercial polymerase chain reaction–based platform with a 2–3-hour turnaround time. These tests were performed alongside ongoing universal screening of patients using a comprehensive list of reported symptoms of coronavirus disease 2019 (COVID-19) infection. All women are asked about fever, shortness of breath, cough, sore throat, body aches, chills, new-onset vomiting, diarrhea, loss of taste or smell, and red or painful eyes. Women who tested positive and those who reported any of these symptoms were clinically evaluated and managed in a dedicated COVID-19 obstetrics unit. Asymptomatic women with pending tests were managed on the routine labor floor, but health care workers used personal protective equipment that included a respirator during



the second stage of labor and delivery until the test result became available.

During this study period, all patients and their support persons were given procedure masks on arrival and asked to wear them during their hospitalization as a means of source control. One support person was allowed to join women admitted for delivery; these support people were screened for COVID-19 infection using symptom assessment, but testing for support persons was not performed.

RESULTS

Over the first 20 days of universal testing, 635 pregnant women were admitted to Northwestern Memorial Hospital, of whom 23 (3.6%) tested positive for SARS-CoV-2 infection. Of the 23 who tested positive, 10 (43.5%) were asymptomatic on initial presentation. Twenty-one (3.3%) pregnant women who were admitted reported symptoms of COVID-19 infection. Of these 21 women who exhibited symptoms, 13 (61.9%) tested positive for SARS-CoV-2 infection. Of the 614 women who were asymptomatic, 10 (1.6%) tested positive for SARS-CoV-2. The distribution of women who reported symptoms, stratified by their SARS-CoV-2 test results, is depicted in Figure 1.

DISCUSSION

Comparison of these data with the data reported from New York City (Sutton D et al. *New Engl J Med* 2020 Apr 13 [Epub ahead of print].) provides some interesting insights. First, our data corroborate the observation

that pregnant women with SARS-CoV-2 infection on admission do not seem to be reliably identified using symptom screening alone. This finding has important implications for policies to mitigate exposure to other parturients, newborns, and health care workers.

Second, testing within the general community across the United States is typically reserved for individuals with moderate to severe symptoms, given the limited availability of testing supplies. Our observed SARS-CoV-2 infection prevalence identified with universal screening (3.6%, 95% CI 2.3–5.4%) is sixfold higher than prevalence rates based on reported rates for our county (0.6%) during this period.³ Comparing the observed SARS-CoV-2 infection prevalence obtained with universal testing (15.4%) at Columbia University Irving Medical Center (Sutton D et al. *New Engl J Med* 2020 Apr 13 [Epub ahead of print].) with the reported prevalence in New York City at that time⁴ (0.7%) generates a 21-fold higher prevalence identified with universal testing on the labor and delivery unit. These ratios stand in contrast to data published from Iceland,⁵ wherein universal testing resulted in an identified prevalence that was merely 1.6-fold higher than the reported country-wide prevalence.⁶ The possibility remains that pregnant women may not be a representative sample of the entire community or that asymptomatic viremia may be increased in pregnancy compared with the nonpregnant state. However, data being produced by labor and delivery units across the United States

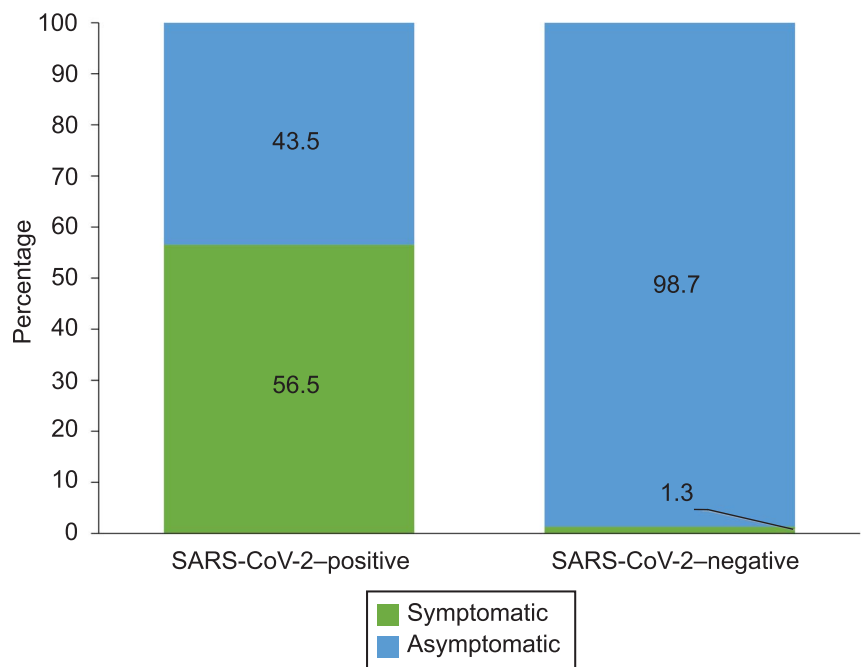


Fig. 1. Percentage of women with symptoms of coronavirus disease 2019 (COVID-19), stratified by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) test result.

Miller. *Universal SARS-CoV-2 Testing in Pregnancy*. *Obstet Gynecol* 2020.



that have implemented universal testing point to the strong possibility that community infection prevalence may far exceed what is currently being reported and may reflect the community prevalence of SARS-CoV-2 infection.

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