Prevalence of SARS-CoV-2 Infection in the Obstetric Population at Admission: Results from a High-Volume Hospital Setting in the North of Italy

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Abstract

Based on the strong recommendation of the World Health Organization to implement testing for SARS-CoV-2, at our Department of Obstetrics and Gynecology in northeast Italy we started performing universal screening in the obstetric population prior to hospitalization. All pregnant women admitted at our department were tested for SARS-CoV-2 with a nasopharyngeal swab test based on the specific SARS-CoV-2 sequences amplification with reverse transcription polymerase chain reaction (RT-PCR) assay. From April 10th to May 25th (45 days), 473 women were tested, and 2 (0.42%) out of 473 patients were found positive to SARS-CoV-2 during the first three weeks when the numbers of infection were higher and social contacts reduced. No patients reported either respiratory or gastrointestinal symptoms. After comparison with other reports, our results suggest a reduction in the prevalence of SARS-CoV-2 in the obstetric population related to both the trend over time and space of the infection spread and the effect of control measures. The identification of only asymptomatic patients appears supporting the implementation of universal screening instead of a test performed based on anamnestic information or symptoms to identify patients with SARS-CoV-2.

Introduction

When the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) outbreak became pandemic, public health strategies for limiting the outspread were adopted, affecting also the daily clinical practice in obstetrics and gynecology [1]. Especially in high-risk areas, social distancing with contact restriction and large-scale screening programs were implemented. Among different strategies to contain the spread of the SARS-CoV-2, the population-based screening with nasopharyngeal swab resulted effective to identify cases and selectively implement restriction measures, even in asymptomatic subjects, which allowed the complete control of the contagion in Vò Euganeo (Verona, Italy), a small town in the northeast Italy where the first Italian death of SARS-CoV-2 pneumonia was detected [2]. Based on this experience and the strong recommendation of the World Health Organization to implement testing for SARS-CoV-2 [3], at the beginning of April 2020, our Department of Obstetrics and Gynecology in northeast Italy, 50 km far from Vò Euganeo, started performing universal screening in the obstetric population prior to hospitalization, as an addition to the protocol for the management of pregnant women with Coronavirus disease 2019 (COVID-19) that was implemented on March 8th, 2020 [4].

Methods

All pregnant women admitted at our department from April 10th to May 25th (45 days) were tested for SARS-CoV-2 with a nasopharyngeal swab test. The determination of SARS-CoV-2 infection was performed with the Allplex 2019-nCoV assay kit (Seegene, Seoul, South Korea) following the manufacturer's indications. The test was based on the specific SARS-CoV-2 sequences amplification with reverse transcription polymerase chain reaction (RT-PCR) assay, which represents the gold standard [5].

Results

Our Institution is the referral center for obstetric care in an area with 250,000 inhabitants with more than 3,500 delivery per year. From April 10th to May 25th (45 days), 473 women were tested: 410 pregnant women at term or preterm, 5 women admitted during the puerperium, 4 women hospitalized for miscarriage, and 2 women admitted for extra-uterine pregnancy; fifty-two swab tests were performed in women admitted for legal abortion. During this time period of 45 days, no patients reported either respiratory or gastrointestinal symptoms. Only one patient complained of ageusia and anosmia, but two consecutive nasopharyngeal swabs performed 48 hours apart resulted negative and no other symptoms occurred subsequently. Only two (0.42%) out of 473 patients were found positive to SARS-CoV-2.

The first positive patient had close contact with a confirmed case, but she was asymptomatic, with the nasopharyngeal swab positive for SARS-CoV-2 RT-PCR at discharge and recommended isolation at home. The second positive patient was asymptomatic and the SARS-CoV-2 infection was identified at the admission for labor. Noteworthy, this patient had a previous hospital admission for suspected SARS-CoV-2 infection during the 8th month of pregnancy, although she was discharged home after clinical improvement and two consecutive negative swab tests.

Discussion

First data regarding the prevalence of SARS-CoV-2 in the asymptomatic obstetric population were collected in New York by Sutton et al from March 22nd to April 4th, 2020 [6], who found a prevalence of 13.7% (29/210). A second report came from Milan, northern Italy, from April 1st to April 9th, 2020, which reported a proportion of 0.8% of positive nasopharyngeal swabs in asymptomatic women (1/133) [7]. The results collected in our Department show a lower prevalence of positive patients, with 2 (0.42%) cases out of 473 women, suggesting a trend over the reduction of cases.

Assuming a comparable diagnostic accuracy of the adopted tests in the three reports, the observed differences suggest a reduction in the prevalence of SARS-CoV-2 in the obstetric population related to both the trend over time and space of the infection spread and the effect of control measures. The data collected in the three cities were collected in three different phases of the infection spread; data collected in New York refer to an earlier phase of the infection spreading as compared to Italy (Milan and Verona). Similarly, data collected in Verona refer to a later phase of the contagion spread and adopted social restrictions as compared to Milan. However, caution is required, and we need to consider possible confounders. Indeed, the true prevalence of SARS-CoV-2 cannot be determined with certainty, especially due to the false-negative rate of nasopharyngeal swab with RT-PCR that was reported as high as 30%, with an estimated sensitivity and specificity of 78.2% and 98.8% respectively [8].

Regardless of the comparison between the three reports, even alone, our data appear suggesting that the prevalence of SARS-CoV-2 in the obstetric population is reducing following the decrease of the infection spreading. Our collection of data refer to a longer period than the other studies (45 days vs 10 and 13 days), which can be separated in two different phases: the first three weeks of strict restriction and the second three weeks in which activities re-opened after the trend of infections started to slow down. As

support of our observations on prevalence changes in the obstetric population, the two positive cases in our report were identified during the first three weeks, when the numbers of infection were higher and social contacts reduced. Hence, our results suggest that the prevalence of SARS-CoV-2 in the obstetric population is reducing, although the identification of cases and prevention of transmission is still of paramount importance to avoid a possible second spread of infection. In this regard, the identification of only asymptomatic patients appears supporting the implementation of universal screening instead of a test performed based on anamnestic information or symptoms to identify patients with SARS-CoV-2, who can become a source of infection for health care providers and other patients.

Declarations

Ethics approval and consent to participate:

All patients signed informed consent for all the procedures they underwent and to allow data collection and analysis for research purposes. This observational report does not contain any intervention by the authors and is limited to epidemiological description, with anonymized handling of the data. The design, analysis, interpretation of data, drafting and revisions conform the Helsinki Declaration, the Committee on Publication Ethics (COPE) guidelines (<http://publicationethics.org/>) and the RECORD (reporting of studies conducted using observational routinely-collected health data) statement available through the EQUATOR (enhancing the quality and transparency of health research) network (www.equator-network.org).

Consent for publication:

Informed consent for publication was obtained from all participants.

Availability of data and materials:

All data generated or analysed during this study are included in this published article.

Competing interests:

The authors declare that they have no competing interests.

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Authors' contributions:

All the authors conform to the International Committee of Medical Journal Editors (ICMJE) criteria for authorship, contributed to the intellectual content of the study, and gave approval for the final version of the article. M Franchi, J Casarin, and S Garzon: study conceptualization. AS Laganà, M Franchi, and S Garzon: study design. M Bosco, B Barbieri, and M Sangaletti: dataset management and statistical analyses. E Diani, G Lo Cascio, and M Franchi: project administration, methodology validation, and supervision. S Garzon, E Diani, G Lo Cascio, and M Sangaletti: manuscript writing/editing. All authors contributed to the interpretation of results, as well as to the writing and editing of the manuscript.

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