

Rita Figueiredo*, Sara Tavares, Marina Moucho and Carla Ramalho

Systematic screening for SARS-CoV-2 in pregnant women admitted for delivery in a Portuguese maternity

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Abstract

Objectives: The burden of undocumented SARS-Cov-2 infections in Portuguese pregnant women is unknown. At our institution, routine COVID-19 testing was implemented from 19th of March on to all pregnant women who were admitted for delivery. The purpose of the study was to estimate the SARS-CoV-2 infection rate in our obstetric population admitted for delivery.

Methods: Between 19th March and May 4th, 184 pregnant women were screened for SARS-CoV-2 infection upon admission.

Results: Eleven women were positive for SARS-CoV-2, corresponding to a global prevalence of 6.0%. Of these, only two reported symptoms at admission. The prevalence of asymptomatic infection was 4.9%. We report a lower rate of positive cases than other studies. Eighty-two percent of our cases had no symptoms at admission.

Conclusions: The proportion of asymptomatic infection highlights the importance of universal laboratory screening for all women admitted for delivery as opposed to symptom-based screening.

Keywords: coronavirus; COVID-19; pregnancy; severe acute respiratory syndrome coronavirus 2; systematic screening.

Introduction

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and was first identified in December 2019, in Wuhan, China [1]. Twenty per cent of cases manifest no symptoms, and among the symptomatic, a mild respiratory infection with benign course is most frequently reported [2]. When the World Health Organization (WHO) announced COVID-19 outbreak as a pandemic in 11th of March 2020, the effects of this infection on pregnant women and their fetuses were unknown. Regarding disease severity, as historic fatality rate of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) appeared higher in pregnant women, this new pandemic raised concern in the obstetrician community. Following articles did not report an increased risk of developing COVID-19 in pregnant women, compared with the general population [3–6].

Since the beginning of the pandemic, Portuguese government has enacted rules for social confinement, in order to minimize viral spread [7]. In our institution, routine COVID-19 testing for all pregnant women when admitted for delivery, was implemented after 19th of March. In hospital environment, the permanent use of facial mask has become mandatory for health workers and pregnant women in labor. Visits were limited and screening for signs and symptoms of COVID-19 was undertaken. In our institution, a support person was always allowed for women in labor.

The purpose of this study was to estimate the SARS-CoV-2 infection rate in our obstetric population admitted for delivery.

Material and methods

An observational study was conducted from 19th March to May the 4th 2020 in a tertiary hospital. Inclusion criteria included all pregnant women admitted to our hospital to urgent or programmed delivery. Cases of threatened preterm labor in which delivery did not take place until the end of the study duration were excluded. Medical records of all pregnant women admitted to delivery were analyzed.

*Corresponding author: Rita Figueiredo, MD, Department of Obstetrics, Centro Hospitalar Universitário de São João, Porto, Portugal, E-mail: anaritamfigueiredo@gmail.com

Sara Tavares and Carla Ramalho, Department of Obstetrics, Centro Hospitalar Universitário de São João, Porto, Portugal; Faculdade de Medicina da Universidade do Porto, Porto, Portugal; and Instituto de Investigação e Inovação em Saúde, i3S, Porto, Portugal

Marina Moucho, Department of Obstetrics, Centro Hospitalar Universitário de São João, Porto, Portugal

At admission, all pregnant women were asked about symptoms of COVID-19 (fever, cough, dyspnea, sore throat, fatigue, myalgia, anosmia, ageusia) and this information was recorded in their clinical process. In the presence of one or more symptoms pregnant women were considered symptomatic.

All pregnant women admitted for delivery were submitted to routine SARS-CoV-2 testing. Samples were collected from the nasopharynx and oropharynx using swabs that were placed in a viral transport media tube and sent for a quantitative polymerase chain reaction (PCR) test to detect SARS-CoV-2. Test results were available in 8 h. Pregnant women with a scheduled admission for induction of labor or elective cesarean delivery were tested the day before admission. Patients admitted for spontaneous labor were tested at the time of admission. In emergent situations, containment measures were adopted until the result of SARS-CoV-2 screening was available.

Recorded pregnancy outcomes included maternal age, parity, gestational age at delivery and mode of delivery. The prevalence of SARS-CoV-2 infection in women admitted for delivery was calculated from the number of positive women after implementation of universal testing per 100 women tested. All analyses were performed using Stata version 15 for statistical analyses.

All newborns were tested for COVID-19 after delivery and on the second and fifteenth day of life.

This study was approved by the Ethics Committee of our institution.

Results

A total of 186 pregnant women were screened for SARS-CoV-2 infection upon admission. Two cases of threatened preterm labor without subsequent birth were excluded (n=184). Maternal age ranged between 17 and 45 years with a mean age of 32.5. There were 87 (47.3%) nulliparous women and 97 (52.7%) multiparous women. Regarding prematurity, from the 11 SARS-CoV-2 positive women only one had a preterm delivery (9.1%), whereas the remaining 21 preterm births occurred in negative women (12.1%). Sixty-eight percent of women had uncomplicated vaginal delivery and 32% had a cesarean delivery.

Of the 184 patients tested, 11 were SARS-CoV-2 positive with a global prevalence of 6.0%. Of these, only 2 (18%) reported symptoms at admission (one presented with fever, cough and sore throat and the other with anosmia). The majority of SARS-CoV-2 positive women (82%) were asymptomatic, with a global prevalence of asymptomatic infection of 4.9%. Almost all of our SARS-CoV-2 positive women remained asymptomatic or had a mild respiratory disease. The cohort characteristics are presented in Table 1.

No cases of newborn SARS-CoV-2 infection were detected.

Table 1: Summary of cohort characteristics.

Characteristics	Patients (n=184)
SARS-CoV-2 test, n (%)	
Positive	11 (6%)
Negative	173 (94%)
Maternal age, year, mean (SD)	32.5 (5.709)
Parity, n (%)	
Nullipara	87 (47.3%)
Multipara	97 (52.7%)
Preterm deliveries, n (%)	22 (11.9%)
Mode of delivery, n (%)	
Vaginal delivery	126 (68.5%)
Caesarean delivery	58 (31.5%)

Discussion

At our institution, six percent of women admitted to delivery tested positive for SARS-CoV-2 infection. Although in the epicenter of the most affected region in Portugal, we report a lower rate of positive cases than other cohorts [8, 11]. This was probably a consequence of a rigorous period of social confinement imposed by the Portuguese Government starting on the 18th of March. During this period, Portuguese people were strictly confined to their homes and almost all public establishments, commerce and establishments were closed. In addition, in order to reduce the exposure of pregnant women, pregnancy surveillance has been adapted to favor teleconsultations.

The high prevalence of asymptomatic SARS-CoV-2 positive women highlights the importance of universal screening for all women admitted for delivery, regardless of their symptomatology [9, 11, 12]. It allows adequate protection of health care workers with appropriate equipment and allocation of patients in distinct circuits according to their infection status. Preventing infection in health workers is a vital aim of this pandemic, since, apart for the risk it represents for their life, their absence can lead to the system overload and collapse. In our experience, this screening also increased their feeling of security and confidence, which may result in improvement on care provided to these women while in labor.

Identification of asymptomatic infected women with SARS-CoV-2, allowed us to allocate them at isolated rooms preventing the spread of infection during hospitalization stay.

Correct identification of these women can also avoid eventual assumption of pregnancy diseases, such as pre-eclampsia (PE) and HELLP syndrome, by misperceiving analytical changes like elevated liver enzymes and

thrombocytopenia, that may manifest in COVID-19 infection. As Mendonza et al. described, pregnant women with severe COVID-19 can develop a PE-like syndrome that might be distinguished from actual PE by sFlt-1/PlGF, LDH and UtAPI assessment [13].

Important implications for neonatal care also arouse. The knowledge that the mother is infected with SARS-CoV-2 allowed us to discuss hygiene measures to prevent newborn infection with future parents [14].

In line with described data, first in case series from China [3, 6] and then in Europe [12, 15] our experience suggested that COVID-19 seems to have a mild course during pregnancy. Consequently, in pregnant women infected with SARS-CoV-2 there is no justification for changing obstetric management. Nevertheless, physiological adaptations to pregnancy may hamper patient tolerance to hypoxia and dyspnea, eventually worsening prognosis. Therefore, identification of asymptomatic women and close clinical monitoring of this population is vital, while at the hospital and after discharge.

During the study period we reported an unusual decrease in the absolute number of births. By this time, our institution had been considered the main reference for COVID-19 referral in the North of Portugal. In view of that, we believe that healthy low-risk gravidae with uncomplicated pregnancies may have avoided our Centre in order to minimize SARS-CoV-2 exposure. This phenomenon may also explain the high rate of cesarean delivery in the study period (31.5%) which can reflect a superior proportion of high-risk pregnancies, with previous follow-up in our institution.

This is the first prevalence study in pregnant women performed in Portugal. Our results expose the risk that positive asymptomatic pregnant women may pose to health institutions, highlighting the importance of systematic screening upon admission, regardless of the COVID-19 impact on each region.

Our study has some limitations, one of which the relatively small sample. Additionally, we recognize that the recorded prevalence may not reflect the reality in other regions, since COVID-19 has a heterogenic distribution throughout the country and globe.

Scientific community continues its search for an effective drug and vaccine against COVID-19. Until then, social distancing and personal hygiene measures remain the best methods of protection. As previous discussed, our lower rate of positive pregnant women, is probably a consequence of the effective country lockdown, which flattened the epidemiologic curve of the disease. At the time of this manuscript drafting, Portugal will start the phase of deflation, which raises concerns as to whether this lower rate of disease will be sustained.

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Informed consent: Informed consent was obtained from all individuals included in this study.

Ethical approval: This study was approved by the Ethics Committee of our institution.

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