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THEMATIC SECTION: COVID-19 – PUBLIC HEALTH CONTRIBUTIONS

Universal COVID-19 testing in the obstetric population: impacts on public health

Testagem universal de COVID-19 na população obstétrica: impactos para a saúde pública

Detección universal de COVID-19 en la población obstétrica: impactos en la salud pública

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On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic. Since the disease only emerged recently, numerous questions remain to be answered. For example, there are still many doubts concerning the potential for transmission by asymptomatic and pre-symptomatic carriers, thus far there is no provenly effective specific treatment, and it is not known whether acquired immunity after the infection exists or how long it lasts. Measures to reduce transmission are recommended, such as social isolation, hygiene, and use of face masks, besides specific personal protective equipment for health professionals [1,2,3].

As of July 7, 2020, the disease had already caused 542,798 deaths in the world [4], notably with a wide diversity of clinical patterns and multiplicity of organs and systems affected. However, its effect during pregnancy and postpartum is still not completely known. Preliminary data appeared to indicate that pregnant and postpartum women were not more susceptible to COVID-19 [5,6]. However, more recent data suggest the possibility of unfavorable pregnancy outcomes, perhaps related to the body's adaptations to gestation, especially in the cardiovascular and immune systems, also affected by coronaviruses [7,8,9,10,11]. Although evidence of vertical transmission of the virus is still scarce, there are reports of neonatal infection [12], in addition to the increased risk of prematurity due to the exacerbation of clinical symptoms in pregnant women with the infection [6,10], amplifying the potential impacts of COVID-19 on pregnancy, besides the immediate effects on maternal or fetal health. In addition, the literature has reported concerns related to the increased risk of adverse maternal and perinatal outcomes in resource-constrained contexts, particularly Brazil and other Latin American countries [7,13]. Currently, 160 maternal deaths associated with COVID-19 have been published in the world as of July 7, 2020. Of these, 7 in were Iran, 7 in Mexico, 5 in the UK, 16 in the USA, 1 in France, and 124 in Brazil [9,10,14,15,16,17].

One quite relevant aspect of COVID-19 for public health is the lack of knowledge on prevalence of the virus in asymptomatic or oligosymptomatic individual with nonspecific viral symptoms. In all the world, there is a familiar difficulty with universal testing of the population, especially in low and middle-income countries [18]. Even before the pandemic, Brazil had experienced difficulties in reducing or even stabilizing the country's maternal mortality rates [19]. In this context, the determination of COVID-19 prevalence in women during pregnancy, labor, and postpartum is essential for strategic planning of obstetric and neonatal care.

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Due to the health system's universal overload (chronic, and aggravated by the pandemic's demand), barriers to access have hindered prenatal follow-up of normal-risk and high-risk pregnant women, described internationally as a triggering factor for worse maternal and neonatal outcomes [20]. Universal testing of the obstetric population could help plan childbirth care during the pandemic [21,22]. Aspects that would be impacted directly by knowledge of COVID-19 diagnosis in asymptomatic, presymptomatic, or oligosymptomatic pregnant and postpartum women include:

(i) Evaluation of the need for organizational structuring of rooming-in wards, where postpartum women and their newborn infants share the same space, often cramped [3];

(ii) Adequacy of use, supply, and distribution of personal protective equipment (PPE), with rational use, aimed at protecting the healthcare team, a group that is also highly vulnerable to the novel coronavirus infection [23];

(iii) Timely adoption of measures to prevent infection during labor and childbirth, the immediate postpartum, and rooming-in, including specific guidance to maintain breastfeeding [24];

(iv) Adequate guidelines for hospital discharge, including health education for maintaining shelter-in-place and precautions to reduce household transmission.

Six publications of case series have evaluated universal testing programs for COVID-19 in pregnant women admitted to maternity hospitals during labor, for other obstetric reasons or clinical complications (Table 1). The studies were conducted in the USA, UK, Portugal, and Japan [21,22,25,26,27,28]. The studies generally pointed to universal testing as a strategy that would positively impact the planning of health management and healthcare activities, both clinically (better monitoring of pregnant and postpartum women with COVID-19 diagnosis), organizationally (adoption of measures to prevent transmission to healthcare professionals, the obstetric population in general, and infants), and scientifically (knowledge of COVID-19 prevalence in this subgroup).

In the above-mentioned studies, women were tested regardless of the presence of COVID-19 symptoms or contact with known cases of the disease, by collecting swab samples at hospital admission, analyzed with RT-PCR (reverse-transcriptase polymerase chain reaction). As shown in Table 1, the publications in New York, USA, showed the highest percentage of positive cases among all the studies cited. This finding is expected, since at the time of testing, New York had the worst epidemiological situation (Figure 1). The proportion of SARS-CoV-2-positive pregnant women varied from 3.8% to 11.7% in the other localities.

Considering the differences in testing criteria, case definition, and containment measures in each country and local context, the ability to compare these data or extrapolate their applicability to other contexts is limited. However, using the information on cumulative COVID-19 cases in each context on the final date of data collection in the respective studies [29,30,31] and population data [32,33], it is possible to calculate the proportion of COVID-19 cases per million inhabitants in each context (Figure 1). Based on this contextualization, one can anticipate that Brazil, compared to other localities, would have at least intermediate COVID-19 prevalence in pregnant women if universal testing policies were adopted. Considering that differences in the number of tests performed per million inhabitants in the various countries reflect different magnitudes of underreporting, it would be reasonable to anticipate

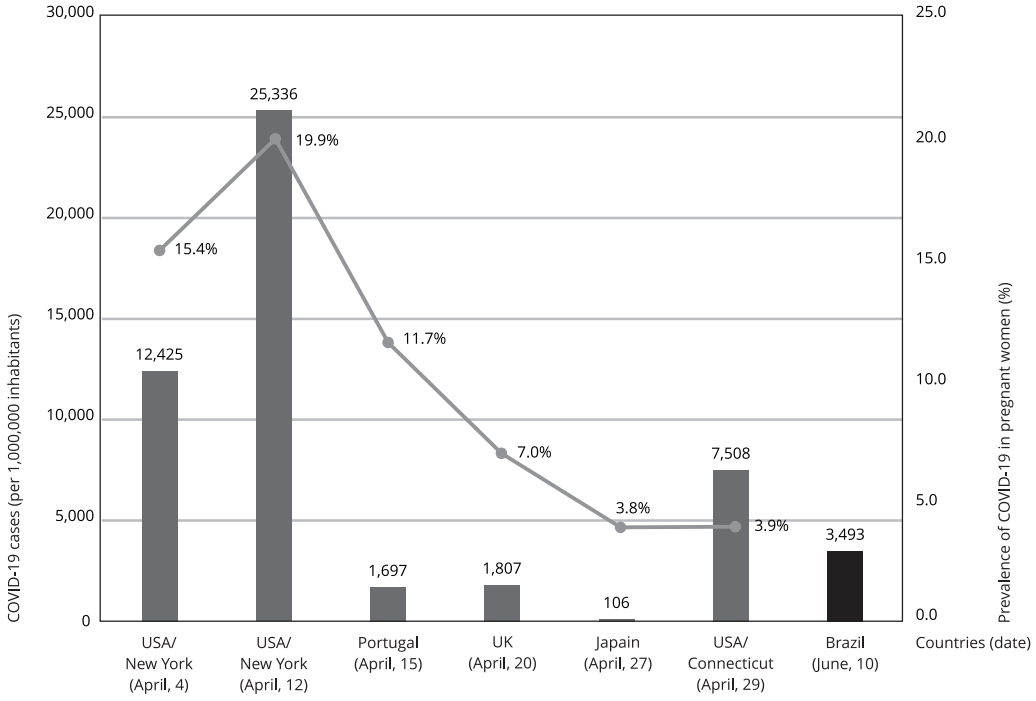
Table 1

Findings from case series of universal COVID-19 testing in the obstetric population.

Study	Country	Sample size	Women with positive test for SARS-CoV-2 (%)	Asymptomatic women (%)
Campbell et al. [27]	USA (New Haven, Connecticut)	770	3.9	73.3
Sutton et al. [21]	USA (New York)	214	15.4	87.9
Vintzileos et al. [28]	USA (New York)	161	19.9	66.6
Khalil et al. [22]	UK (London)	129	7.0	88.9
Doria et al. [25]	Portugal (North)	103	11.7	91.6
Ochiai et al. [26]	Japan (Tokyo)	52	3.8	100.0

Figure 1

Prevalence of COVID-19 in pregnant women and proportion of COVID-19 cases per million inhabitants in each context.



an even more critical situation in Brazil. For example, the three scenarios in the USA would represent between 15,538 and 26,594 tests per million inhabitants [29,30,33]. In Brazil, as of June 10, the number of recorded COVID-19 tests represented 4,706 per million inhabitants [4], potentially indicating the existence of a much higher number of cases than officially recorded, which would be reflected (by extension) in the estimated COVID-19 prevalence in the obstetric population.

These studies also report data on the percentage of pregnant women with COVID-19 who were asymptomatic at admission, ranging from 66.6% to 100% (Table 1). Importantly, the definition of suspected cases in many contexts in Brazil still necessarily include the presence of fever, which limits eligibility for testing, even in patients hospitalized with other symptoms suggestive of COVID-19, but who do not present fever. Likewise, a literature review compiling data from case series found that only about 50% of obstetric patients with COVID-19 were febrile at hospital admisstion [12]. According to the *Epidemiological Bulletin* [34] of the Brazilian Ministry of Health, which reports the profile of pregnant women with severe acute respiratory syndrome (SARS) due to COVID-19 in Brazil, only 72.9% of the cases presented fever, which shows that even among severe cases, more than one-fourth were afebrile.

These data emphasize the need for universal testing of obstetric patients as an urgent strategy to protect pregnant and postpartum women and their infants, as well as health professionals during the pandemic, allowing adequate planning of referral flows, care during labor and childbirth, and heightened surveillance focused on the prevention of deaths and near misses. Universal testing will help decrease the pandemic's impact on women, especially more vulnerable pregnant women, who bear the heaviest burden of maternal mortality.

Contributors

M. O. Menezes and M. L. S. Takemoto participated in the study's conception and planning, data collection and analysis, writing of the initial version, and revision and approval of the final version. C. B. Andreucci, M. Nakamura-Pereira, R. Knobel and C. G. Magalhães participated in the study's conception and planning, data analysis, writing of the initial version, and revision and approval of the final version.

Additional informations

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