First results of universal SARS-CoV-2 virus testing of asymptomatic pregnant patients presenting for antenatal care at the Kalafong Provincial Tertiary Hospital

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Abstract
Background: The current COVID-19 pandemic caused by the SARS-CoV-2 virus has reached the stage of community spread in South Africa. Asymptomatic carriers have been reported amongst pregnant women. Against this background, a strategy of universal testing of all patients visiting facilities for antenatal care should be considered, as this information will allow proper planning of obstetric services as well as reducing risk to health care workers and patients.
Methods: Asymptomatic pregnant women visiting Kalafong Provincial Tertiary Hospital in Atteridgeville, Pretoria, for antenatal care were randomly selected for SARS-CoV-2 PCR testing.
Results: We report the results of the first 67 patients who were tested. Their mean age was 33.3 years (SD = 6.44), and 34.3% were HIV infected. Sixteen patients (32.8%) had comorbidities such as diabetes mellites type II/gestational diabetes and hypertension. All 67 women tested negative for SARS-CoV-2 infection.
Conclusion: The asymptomatic carrier status at this point in time is still zero, reflecting the early stage of the epidemic in Tshawane at the time of tesing. Universal testing of this group of patients should continue, as early identification of asymptomatic carriers in pregnant women is essential for the provision of safe obstetric care, especially against the background of the presence of significant comorbities in this population group.
Key words: SARS-CoV-2, COVID-19, pregnancy, antenatal care, HIV.

Introduction

The current COVID-19 pandemic caused by the SARS-CoV-2 virus is providing unique challenges with regards to patient care, including obstetric care. The pandemic has reached a phase of community spread in South Africa. There is limited data regarding the effect of COVID-19 infection on pregnant patients and the provision of obstetric care.

Pregnant women and their fetuses represent a high-risk population. Pregnancy associated changes increase the susceptibility to infections in general and especially those pathogens targeting the respiratory system.[1] There is very little data at this stage regarding pregnancy outcome in patients with COVID-19 disease. There is no evidence from limited data from other coronavirus outbreaks (SARS and MERS) suggesting pregnant women are more susceptible to infection with coronavirus. In the current COVID-19 disease outbreak, men have been affected more than women.[2] Clinical presentation in pregnancy is similar to that of non-pregnant patients with fever and cough being the most common symptoms in hospitalised patients. [2] Fetal growth restriction has been reported in women with the infection in the second and third trimester.[3] While some reports described ICU admission, preterm labour and fetal distress associated with SARS-CoV-2 infection, other reports suggest pregnant women generally have absent or mild respiratory symptoms not requiring intensive care.[4-5] Maternal deaths due to COVID-19 disease have also been reported.[6-7]

Yang et al[8] published a review of 18 studies comprising 114

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women. Fever and cough were the most commonly reported symptoms, and 91% of the patients had caesarean section deliveries for various reasons. Dyspnoea has also been reported as a presenting symptom. [9]

Asymptomatic carriers have been described as a critical aspect of SARS-CoV-2 infection, with Gandhi et al[10] describing it as the Achilles' heel of managing the current pandemic. Asymptomatic carriers in pregnant women admitted to labour wards in New York have been reported.[11] Recent reports have shown a significant prevalence of asymptomatic carriers of SARS-CoV-2 infection when universal testing is performed on women admitted to labour wards. [12-13] Affected patients continue to be infectious two weeks after becoming asymptomatic. With community spread and the known existence of asymptomatic carriers, the current screening of patients to be tested has become very ineffective. Sutton et al[12] reported 29 out of 33 pregnant patients who tested positive for SARS-CoV-2 following universal testing were asymptomatic.

All pregnant women visiting the antenatal clinic at Kalafong provincial tertiary Hospital (KPTH) are currently being screened for possible SARS-CoV-2 virus infection, and this process will continue with those who screen positive to be tested and kept in isolation on the hospital premises until the test result becomes available. The fact that a significant number of patients are asymptomatic carriers, and the fact that we seem to not at this stage have a clear understanding of the pathophysiology and pathogenesis of this specific viral infection, with some patients presenting with neurological symptoms, stroke, or pulmonary emboli, suggest the strategy relying on the current implemented screening method needs to be revised and should be replaced with a strategy of universal testing.[14-16] There is also a need and a responsibility to ensure the safety of healthcare workers as far as possible.

A strategy of universal testing of asymptomatic pregnant women will provide important information on the prevalence of asymptomatic carries in the population, and it will also asssit in planning obstetric care in the hospital when the COVID-19 disease logarithmic increase in cases is reached and potentially many asymptomatic patients are requiring obstetric care. Known SARS-CoV-2 virus status of pregnant women presenting for obstetric care in the labour ward will assist in the protection of healthcare workers in the labour ward as well as other patients in the hospital.

The Minister of Health has indicated that between 20 000 and 30 000 tests per day is needed to get an accurate picture of the pandemic in South Africa. Universal testing of pregnant patients will contribute towards this strategy, and in addition will target a healthy section of the population that will be making use of healthcare facilities in the near future.

The Department Obstetrics & Gynaecology at KPTH provides obstetric care to around 7000 patients per year of which roughly 30% deliver by caesarean section. At this moment in time there is no data on the prevalence of asymptomatic SARS-CoV-2 carriers in this population group. This data is now essential and will contribute to sensibly plan the obstetric care to be provided in the next few weeks when the numbers of SARS-CoV-2 virus infected patients are expected to increase substantially. Health care providers in obstetrics are primary contacts with the population and as such are having a significant SARS-CoV-2 virus exposure risk, and the data collected from universal testing of these patients will be used to make objective decisions for the protection of doctors and nurses providing obstetric care to South African pregnant women.

Materials and methods

All asymptomatic for SARS-CoV-2 virus infection pregnant women visiting the antenatal clinic at KPTH, 18 years and older, willing and able to provide informed consent were eligible for inclusion in the study. Women who screened positive or who were suspected of having COVID-19 disease were not eligible for recruitment.

Nasopharyngeal swabs from randomly selected patients for PCR SARS-CoV-2 virus testing were collected by trained staff wearing personal protective equipment (PPE). Swabs were sent to the National Health Laboratory Services (NHLS) for testing. As this is not indicated testing, patients were not isolated until the test results become available. The arrangement with patients were that those with positive test results would be contacted and they and their close contacts would be managed according to the current national guidelines, while patients with negative test results would be informed of their results at their next clinic visit.

Demographic data and information on symptoms and co-morbidities were collected and entered on an Excel spread sheet. Data analysis was done by descriptive statistics to describe means and standard deviations in case of continuous data and frequencies.

Ethics approval was obtained from the Research Ethics Committee, Faculty of Health Sciences, University of Pretoria (270/2020).

Results

The study is ongoing and the results reported here are those of the first 67 patients that were tested. The mean age of the group was 33 years (SD = 6.44). The rest of the demographic data is shown in Table 1.

Table 1. Demographic data

	Mean	Standard deviation
Age	33.34	6.44
Parity	1.82	1.2
Gravidity	3.26	1.45
	n	%
Married	43	64.18
Single	23	33.33
Widow	1	1.49

Forty four women (65.7%) were HIV negative and 23 women (34.3%) were positive, with 11 women (47.8%) having undetectable viral loads and the mean CD4 count was 464.93 cells/mm^3, with no woman having a CD4 count below 200 cells/mm^3.

Nine women (13.4%) had type II or gestational diabetes, five women (7.5%) were hypertensive and two women (2.9%) had asthma. Although all patients were screened for symptoms suggestive of possible COVID-19 disease, five women (7.5%) had symptoms, of of which four (5.9%) reported having a cough and one woman (1.5%) reported having cold or flu-like symptoms. Two women (2.9%) were smokers.

The women in this study on average shared accommodation with three (SD = 1.71) other people. Accommodation was shared with a mean number of 1.89 (SD = 1.06) adults and 1.23 (SD = 1.27) children.

None of the patients in this group tested positive for SARS-CoV-2 infection.

Discussion

This small group of pregnant women seen at KPTH were the first to undergo universal testing at this institution. Although it is a small sample size, the results are somewhat unexpected. Suttner et al.[12] reported an asymptomatic carrier rate of 13.7% and if the rate was similar in this population, one would have expected to see between seven and nine positive patients. Arons et al.[17] reported 56% of patients in a skilled nursing facility were asymptomatic at the time of testing positive for SARS-CoV-2, of which 88% became symptomatic. The finding of this study most likely represent the early stage of the pandemic at this moment in time in South Africa, as testing was carried out over a three day period in the last week of April 2020.

The HIV prevalence is in keeping with what was expected in this study population. The effect of HIV on SARS-Cov-2 infection

is not known, with very limited data available at the moment, and no data on pregnant HIV infected women. Härter et al.[18] did not report an increased mortality in a cohort of 33 patients. Concerns have been raised about the effect of the COVID-19 pandemic on HIV care.[19]

Sixteen patients (32.8%) had comorbidities associated with an increased risk of hospitalisation or mortality should they become infected with the SARS-CoV-2 virus. Hypertension and diabetes have been reported to be independent risk factors for severe disease and poor prognosis including mortality in patients with COVID-19 disease.[20-22] The information on maternal deaths at this moment in time does not allow for the identification of possible risk factors for mortality in pregnant women with COVID-19 disease. Other risk factors such as obesity were not investigated in this study.

The fact that these women, as most other people in the community, share accommodation with other people, is an important consideration with regards to the management and isolation of asymptomatic pregnant women.

One of the important identified challenges of universal testing at this facility is the capacity of the NHLS to perform testing and the turnaround time. It was not possible to test patients every day and it took an average of five days to receive the results of these tests.

Conclusion

South Africa is still in the early stages of the SARS-CoV-2 infection pandemic, with around 11 000 infections and more than 200 deaths at the time of writing this manuscript. Asymptomatic carriers is a concern in pregnant women, and there is some sense in universal testing of women presenting for antenatal care who will be admitted into a health care facility in the near future, especially against the background of the presence of significant comorbities in this population group. Although the finding of no asymptomatic carriers in a small cohort of patients tested is encouraging at this stage, it represents the early stage of the epidemic curve in Tshwane at the time of testing.

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