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The Maternal and Perinatal Outcomes of Pregnancies Complicated by Covid-19: A Retrospective Study at a Tertiary Facility in Guyana (Georgetown Public Hospital Corporation)

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ABSTRACT

Background: In December 2019, there was an outbreak of pneumonia cases in the city of Wuhan, China. The outbreak was first manifested as a cluster of mysterious pneumonia cases mostly related to the Huanan Seafood market in Wuhan, the capital of Hubei Province. Genomic investigations of the pathogen found that the disease was caused by a new strain of coronaviruses and the disease was given the name "Covid 19". Pregnant women with Covid-19 may be at greater risk of severe illness although the full impact of the infection in pregnancy is unknown. Amongst the Guyanese population, several pregnant mothers have tested positive to Covid-19 thereby generating major concerns.

Objectives: To ascertain the maternal, perinatal and immediate neonatal outcomes of pregnancies complicated by Covid-19 infection at the Georgetown Public Hospital Corporation, Guyana.

Method: This study is a retrospective chart review of pregnant patients who were diagnosed with Covid-19 from August, 2020 to April 2021 and delivered at GPHC. The data collected include socio-demographics of patients, parity, gestational age at delivery, birth weight amongst others.

Results: This retrospective study was able to show the outcomes of Covid-19 in pregnant patients at the Georgetown Public Hospital from August, 2020 to April, 2021. During this study period, the total study population of this research was 4,686 of which only seventy-nine (79) participants fit the study criteria.

Conclusion: This retrospective study shows there was no statistically significant impact seen in the maternal and neonatal outcomes of pregnancies complicated by Covid-19 infection at Georgetown Public Hospital Corporation (GPHC).

Keywords: Maternal and Perinatal Outcomes of Pregnancies, Covid-19, Georgetown Public Hospital Corporation

INTRODUCTION

Coronaviruses/coronaviridae (CoV) are a group of enveloped positive-strand RNA viruses that affect humans, amphibians and birds, causing illnesses ranging from the common cold to severe respiratory and circulatory system dysfunction.

In December 2019, there was an outbreak of pneumonia cases in the city of Wuhan, China. The outbreak was first manifested as a cluster of mysterious pneumonia cases mostly related to the Huanan Seafood market in Wuhan, the capital of Hubei Province. Genomic investigations of the pathogen found that the disease was caused by a new beta strain of coronaviruses- the novel coronaviruses (nCoV/SARS CoV-2). The disease was given the name "Covid 19". In

January 2020, the new strain was identified as the cause of the pneumonia by Chinese scientists[1]. The outbreak was first reported by the Chinese Government on 27 December 2019 and published 31 December. On January 30, 2020, the World Health Organization (WHO) declared the outbreak a public health emergency of international concern. In February 2020, a global pandemic was declared by the WHO. Subsequently, the WHO (and other health and disease regulatory/observatory bodies) began daily monitoring of morbidity and mortality patterns of the infection in humans. The known mode of transmission of SARS-CoV-2 virus is directly through respiratory droplets from person to person or indirectly via surfaces that have been colonized by viruses left behind by infected persons. These known modes of transmission prompted the WHO to issue public health advisories of physical distancing, stay-at-home/lockdowns, hand sanitizing, the use of face coverings, screening for symptoms of Covid-19 and mass testing for case identification (regardless of symptoms). These measures are advocated as primary measures to help "*flatten the curve*" (diminishing the total number and rate of new infections). Auxillary/secondary measures were also advocated to help "*raise the line*"- a phrase coined to drive increase healthcare capacity in this pandemic (such as designating/building and equipping new facilities dedicated only to Covid 19 patients, increasing healthcare workforce, provision of appropriate personal protective equipment/PPEs to healthcare workers and telemedicine).

The full impact of SARS-CoV-2 remains unclear in pregnancy. The latest update (12 March 2021) from the WHO website as relates to Covid-19 and pregnancy states, "*Pregnant women with Covid-19 are less likely than non-pregnant women with Covid-19 to have symptoms, but more likely to need intensive care if severely ill*". The guideline is based on a 'living systemic review',

ongoing, global, research which is synthesizing data on the situation for pregnant women with Covid-19 in countries worldwide and it is being led by researchers at the WHO, University of Birmingham (UK), and other collaborators (*WHO website*). In 2020, the National Health Service (NHS), UK, on its website, included pregnant women in the moderate risk (clinically vulnerable) group of persons (largely as a precaution), having also stated that the risk of pregnant women contracting covid-19 is not higher than that of the general population.

Locally (in Guyana), the index case in Guyana was recorded on 11 March 2020 at GPHC, an imported case from the United States. The first pregnant woman to test positive to SARS-CoV-2 in Guyana was on 30 March 2020 at GPHC even though she was asymptomatic[10]. She had been a close contact of a covid positive individual. There is a paucity of information on the burden of disease and the effects of Covid 19 on pregnancy (or vice versa) in Guyana.

Objectives of the Study
To ascertain the maternal, perinatal and immediate neonatal outcomes of pregnancies complicated by Covid-19 infection at the Georgetown Public Hospital Corporation, Guyana.

METHODOLOGY
Study Design/Setting/Sampling
This study design is a retrospective chart review of pregnant patients who were diagnosed with (confirmed to have had) COVID-19 from August 1st, 2020 to April 30th, 2021 at the GPHC. All pregnant patients with confirmed diagnosis of COVID-19 infection in pregnancy (without randomization), managed and delivered by obstetric providers at the GPHC from August 1st, 2020 to April 30th, 2021 were included in the sample population. National and Institutional IRB approvals were sort and obtained for this research.

RESULTS

Characteristics	Summary/Frequency	
Maternal age (years)		
• 13 – 19	18 (22.8%)	
• 20 – 29	38 (48.1%)	
• 30 – 39	17 (21.5%)	
• 40 – 49	06 (7.6%)	
	Mean: 26.4	
	Range: 14 – 43	
	Standard deviation: 7.5	
Regions		
Region 1	34 (43%)	
Region 2	1 (1.2%)	
Region 3	2 (2.5%)	
Region 4	10 (12.6%)	
Region 5	5 (6.3%)	
Region 6	0	
Region 7	13(16.4%)	
Region 8	10(12.6%)	
Region 9	2(2.5%)	
Region 10	10(12.6%)	
Parity		
• Nulliparous	30 (38.0%)	
• Multiparous	28 (35.4%)	
• Grand parity	21 (26.6%)	
Gestational age at delivery		
• Preterm <37weeks	8 (10.1%)	
• Term (37-41weeks)	68 (89.5%)	
• Post-term (42 or more)	3 (3.8%)	
Mode of delivery		
• Vaginal	55 (69.6%)	
• LSCS	24 (30.4%)	
Blood loss	≤500mL:	501 – 1000mL:
• Vaginal	57 (72.2%)	4 (5.0%)
• LSCS	16 (20.3%)	2 (2.5%)
Birthweight		
• Low birthweight <2,500g	7 (8.9%)	
• Normal birthweight (2,500g-4,000g)	66 (83.5%)	
• Macrosomia >4,000g	6 (7.6%)	
• Missing: 2		
Five-minute APGAR scores		
• Less than 3	1 (1.3%)	
• 4 - 6	0 (0)	
• 7-10	78 (98.7%)	

Table 1. Characteristics of Covid-19 positive prenatal patients at the GPHC from August 2020 – April 2021.

DISCUSSION & CONCLUSION
The Epidemiological Profile.
Prevalence of Covid-19 among patients who delivered at the GPHC from 1st August 2020 to 30th April 2021.

Total number of patients who delivered during the study time period: 4,686
Total number of patients who delivered had Covid-19 at the time they presented to the hospital: 79

Prevalence: $\dfrac{Number\ of\ patients\ with\ the\ disease\ during\ the\ study\ time}{total\ number\ of\ patients\ during\ the\ study\ time} = \dfrac{79}{4868} = 0.017\ or\ 1.7\%$

Thus, the prevalence of Covid-19 among patients who delivered at the GPHC between August 2020 and April 2021 was 1.7%.
The 79 patients in this study were all tested positive for Covid-19 via reverse transcriptase-polymerized chain reaction from nasopharyngeal swab on admission.

There no significant differences among the number of patients who were nulliparous (38%), multiparous (35.4%) and grand multiparous (26.6%). This corresponds with the Ashokka B, et al study which shows no correlation between parity and its impact on Covid-19 pregnancies.

Of the 79 patients, the greater majority of neonates (78.5%) were born full term, (26.1%) preterm and (3.8%) post term. This corroborates findings similar to Chmielewska B, et al [4] with analysis showing insignificant preterm births with Covid-19. In this study population, there were 3.5 times as many vaginal deliveries (72.2%) as were LSCS deliveries (20.3%).

64 (81.0%) of neonates had normal birth weight of 2,500grams or more, 7(8.9%) macrosomic neonates greater than 4,000 grams and low birthweight below 2500grams in 6(7.6%) population similar to findings from Allotey J, et al [5].

No patient had more than 1000mL blood loss and almost all neonates (98.7%) had a reassuring five minute APGAR score and only (1.3%) with non-reassuring APGAR score at 5 minutes.

In the context of the covid-19 pandemic, ongoing collection of data on the outcomes of infection during pregnancy will remain important. Unanswered questions remain about the extent and effect of asymptomatic or mild infection. Long term follow of these patients and their offsprings may be useful to discover long term sequalae of this disease. For now, available data suggests that pregnant women are not disproportionately affected and though transmission of infection to infants can occur, it is uncommon.

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