

Materno-foetal outcomes of COVID-19 Pregnant Women Followed-up at a Tertiary Care Unit in sub-Saharan Africa: a descriptive study.

Madye Ange Ngo Dingom (✉ dingom20022003@yahoo.fr)

Central hospital of Yaounde <https://orcid.org/0000-0003-0591-4883>

Eugène Sobngwi

Department of Medecine and Biomedical Sciences

Félix Essiben

Department on Medecine and Biomedical Sciences

Antoinette N. Assiga

central Hospital of Yaounde

Yves F. Wasnyo

Central Hospital of Yaounde

Anicet Ngate

Obstetric and Gynecology Department of Medical Faculty and Biomedical Sciences

Jean C. Katte

University of Exeter

Junie Y. Ngaha

Central Hospital of Yaounde

Philemon Nsem

Central Hospital of Yaounde

Charles E. Sone

Central Hospital of Yaounde

Brigitte Wandji

Central Hospital of Yaounde

Gilles T. Libend

Central Hospital of Yaounde

Jean J. Bissemou

Central Hospital of Yaounde

Filbert E. Eko

Central Hospital of Yaounde, Department of Obstetrics and Gynecology, Higher Institute of Medical Technology of Nkolondom

Florent Y. Fouelifack

Central Hospital of Yaounde, Department of Obstetrics and Gynecology, Higher Institute of Medical Technology of Nkolondom

Glwadys Ngonu

Faculty of Medicine and Biomedical Sciences

Jeanne Fouedjio

Faculty of Medicine and Biomedical Sciences

Rebecca Tonye

Central Hospital of yaounde

Pierre Ongolo-Zogo

Faculty Of Medicine and Biomedical Sciences

Pierre J. Fouda

Central Hospital of Yaounde

Robinson E. Mbu

Faculty of Medicine and Biomedical Sciences

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Abstract

Background: The SARS-CoV-2 and associated corona virus disease COVID-19 has been declared a pandemic having a poor prognosis among individuals with debilitating conditions and those who are immune compromised. Current evidence is however limited on materno-fetal transmission and pregnancy outcomes. We aimed to describe the pattern of SARS-CoV-2 infection and outcomes in a group of pregnant women followed-up at a tertiary care unit in Cameroon.

Methods: This was an observational study conducted over a period of 3 months (April 1 to June 30, 2020) at the Yaounde Central Hospital. All pregnant women who were tested positive for SARS-CoV-2 and who provided a signed written informed consent were included in the study.

Results: Out of 83 pregnant women who presented with symptoms suspicious of COVID-19, 25 were tested positive. The median age of these women was 31 (27 – 35) years. A total of 76% consulted within 6 days of onset of symptoms and 68% had a gestational age greater than 28 weeks. The most common presenting complaint was fever (88%). All 25 pregnant women who tested positive for COVID-19 were followed up with 9/25 deliveries registered. There were two intra-uterine foetal death and seven live births. All the live birth babies tested negative on Real Time-Polymerase Chain Reaction (RT-PCR) testing which was performed after birth.

Conclusion: Deliverance of live and SARS-CoV-2 negative babies from COVID-19 pregnant women is possible.

Background

In December 2019, the first cases of pneumonia due to a new coronavirus, SARS-CoV-2 were described in China (1). In early March 2020, the disease, now known as COVID-19, was declared a pandemic by the World Health Organisation (WHO). To date, the world has nearly 13 616 593 cases and approximately 585 727 deaths (2) among which 16 057 cases and 369 deaths have been recorded in Cameroon as of July 17, 2020 (2). COVID-19 is now known to portray a vast array of clinical manifestations ranging from pauci symptomatic individuals to overt respiratory distress (3). The disease is thought to be severe in the elderly and patients with chronic debilitating conditions such as hypertension, heart failure and diabetes and other immune compromised states.

Pregnancy is generally known to be an immune compromised condition and so pregnant women may be at risk of severe COVID-19 given that back in 2003 and 2012 fatal forms of coronavirus pneumopathy were identified with SARS-CoV-1 and MERS-CoV infections in pregnancy (4) (5). However, to date, the available data related to SARS-CoV-2 infection do not indicate a higher infection rate or increased risk of severity in pregnant women compared to the general population (6) (7). There are few descriptions of maternal-fetal transmission of COVID-19 and their corresponding outcomes in the literature at the moment and none has otherwise been described in sub-Saharan Africa. We therefore aimed to describe

the outcomes of materno-fetal transmission of COVID-19 in a group of women followed up at the Yaounde Central Hospital in Cameroon.

Methods

Study design and setting

This was a prospective observational study which lasted for 3 months (April 1 to June 30, 2020) at the Obstetric and Gynecological Unit of the Yaounde Central Hospital in Cameroon. This unit provides tertiary care to pregnant women and serves as a referral unit for over 40 district hospitals in the centre region of Cameroon. The unit is served by 14 Physicians and 20 non-physician staffs. Mask wearing was compulsory for all staffs and patients in the unit with staffs using additional prescribed protective gears.

Study participants

All COVID-19 positive pregnant women who were screened-diagnosed [via the Real-Time Polymerase Chain Technique, (RT-PCR)] during the time of the study were included after a signed written informed consent was provided. All data provided by the participants were recorded in anonymised forms which were available only to the clinical and research team.

Data collection

Data was collected from the participants prenatal consultation and pregnancy monitoring record as well as their referral sheet (if they were referred for care with a positive COVID-19 test). Data was recorded onto a pre-structured data collection form designed for the study. We interviewed the participants or their accompanying family carer to complete their socio-demographic characteristics, medical and pregnancy history, presenting complaints and treatment received. A complete physical examination was performed by the attending physician or nurse and obstetric parameters were also recorded.

Data management

Data was entered into a prepared Microsoft Excel 2010 Spreadsheet by a non-clinical staff. The data was then double-checked item by item to ensure accuracy and completeness. The data was later exported to SPSS version 23 for analysis. Data was expressed in frequency, percentage and median (interquartile range) were necessary.

Results

Baseline characteristics of the study participants

Over the 3 months period, a total of 1197 pre-natal consultations were registered with 83 pregnant women tested for SARS-CoV-2 based on their presenting symptoms, of whom 25 had a positive COVID-19 test. Of the 25 pregnant women, 23 were PCR-confirmed cases while 2 were positive on a serologic test. Table 1 show the baseline characteristics of the study participants. The majority (64%) of women were aged between 25 to 35 years. Most patients came to consult within at least 6 days after the onset of

initial symptoms (76%), and more than half of them having a gestational age greater than 28 weeks of amenorrhea (68%).

Table 1: Socio-demographic characteristics of the study population

| Characteristics | Frequency (n=25) | Percentage (%) |
|---------------------------------------|------------------|----------------|
| Age, years | | |
| 15-24 | 3 | 12.0 |
| 25-35 | 16 | 64.0 |
| >35 | 6 | 24.0 |
| Marital status | | |
| Single | 7 | 28.0 |
| Married | 18 | 72.0 |
| Onset of symptoms before consultation | | |
| 1-5 days | 6 | 24.0 |
| 6-10 days | 11 | 44.0 |
| >10 days | 8 | 32.0 |
| Parity | | |
| Primiparous | 4 | 16.0 |
| Multiparous | 21 | |
| Gestational age of pregnancy (weeks) | | |
| <14 weeks | 2 | 8.0 |
| 15-28 weeks | 6 | 24.0 |
| >28 weeks | 17 | 68.0 |

Median age (IQR)= 31 (27 - 35) years; Min - Max = 18 - 43 years

Presenting symptoms of COVID-19 positive pregnant women

Twenty-two patients (88%) had fever ($\geq 39^{\circ}\text{C}$), eighteen (80%) presented with cough. Nineteen (76%) reported intense fatigue. Symptoms of respiratory involvement were seen as follow: Ten (40%) had respiratory distress, eight (32%) had a rhinorrhoea, 7 (28%) had anosmia and six (24%) had ageusia; Three patients (8%) had had diarrhoea. Ten (40%) of our patients developed severe respiratory distress requiring admission to the intensive care unit. Figure 2 shows the presenting complaints.

Treatment received for COVID-19

Antibiotic (96%) and anti parasitic (88%) treatment had been initiated in the majority of patients. Ten (40%) patients received oxygen therapy and seven (28%) were treated with anti-coagulant therapy. (See Table 2).

Table 2: Treatment received during follow-up>

| Treatment type | Frequency (n=25) | Percentage (%) |
|---|------------------|----------------|
| Azithromycin | 24 | 96,0 |
| Chloroquine and other anti-malarial agent | 22 | 88,0 |
| Vitamin C | 18 | 72,0 |
| Zinc 10mg tablet | 17 | 68,0 |
| Oxygen therapy | 10 | 40,0 |
| Anticoagulant | 7 | 28,0 |
| Other treatment* | 2 | 8,0 |

*Others : Anti-toussive agents, Progesterone tablets

Materno-foetal outcomes and prognosis

Obstetrically, four (16%) patients had their pregnancies terminated, two (8%) had notified the occurrence of uterine contractions and one (4%) had per vaginal bleeding (Fig. 1). All the pregnant women were alive

by the end of the study. Regarding the outcome of pregnancy, we noted that fourteen (56%) women have a current pregnancy. Among the nine (36%) women who gave birth, four (44.4%) had a cesarean section. Acute fetal distress was the indication for cesarean section in three cases. Among the nine births, there were seven live births. All seven neonates were tested negative for COVID-19 via RT-PCR after birth.

Table 3: Table showing maternal and foetal outcomes

| Characteristics | Frequency (n=25) | Percentage (%) |
|---|------------------|----------------|
| Pregnancy outcome | | |
| Abortion | 2 | 8.0 |
| On-going pregnancy | 14 | 56.0 |
| Delivery at term | 9 | 36.0 |
| Mode of delivery (n=9) | | |
| Vaginal | 5 | 55.6 |
| Caesarian section | 4 | 44.4 |
| Indications for Caesarian section (n=4) | | |
| Acute foetal distress syndrome | 3 | 75.0 |
| Cervical dystocia and previous scar | 1 | 25.0 |
| State of neonate at delivery (n=9) | | |
| Alive | 7 | 77.8 |
| Dead | 2 | 22.2 |
| Number of neonate PCR tested (n=7) | 7 | 100 |
| 1. . . PCR SARS-CoV-2 Negative | 7 | 100 |

Discussion

Our study found out that, all seven babies born of COVID-19 positive pregnant women tested negative for the SARS-CoV-2 infection and showed no signs of abnormality. The median age of the pregnant women was 31 years. Most of them (76%), consulted within 6 days of onset of symptoms suspicious of having COVID-19 after failure of the traditional herbal medicines to reduce their symptoms. This delay in

consultation could be explained by the use of the traditional pharmacopoeia for symptoms initially considered mild (11).

During our study, we recorded ten cases (40%) of Severe Acute Respiratory Distress Syndrome linked to COVID-19 pneumonia requiring transfer to intensive care. Due to physiological and immunological changes, pregnant women are more susceptible to severe pneumonia (12) (13). This was noticed during the influenza pandemic in 1918 which caused a mortality rate among pregnant women of 37% against 2.6% in the general population (14). Our findings are similar to those of Wong et al (15) who found 33% of severe forms in pregnant women with SARS and there are studies which have shown up to 79% sequence similarity between SARS-CoV-2 and SARS (16) (17). We did not register any death in our series; but we remain vigilant because the evolution and prognosis of COVID-19 pneumonia could follow the same profile as SARS-CoV-1 and MERS-CoV.

In general, the clinical characteristics are similar in pregnant or non-pregnant women (18). The most frequent symptoms at the start of COVID-19 pneumonia in our series were fever, cough, and asthenia which have been found in similar proportions in other published studies (19) (20); while the least common symptoms were diarrhea, dizziness, anorexia, and chest pain.

All of our study participants received an anti-parasitic/antibiotic association treatment in accordance with the directives of the scientific council of the Ministry of Public Health of Cameroon (8). Only ten women benefited from oxygen therapy who presented with severe respiratory distress (temperature $\geq 38^{\circ}\text{C}$, respiratory rate > 30 cycles / minute, respiratory distress, $\text{SpO}_2 < 90\%$ in ambient air, cyanosis) requiring permanent oxygen therapy to maintain their $\text{SpO}_2 > 92\%$.

Five (55.6%) women delivered vaginally, four underwent an emergency cesarean and two had an abortion. The indications for cesarean sections were fetal distress and cervical dystocia in a patient with a past history of cesarean section. Two chinese studies show that their route of delivery was caesarean in 100% and 76.9% respectively (7) (21). Two (22.24%) of the five vaginal deliveries occurred while the patients were under investigation for their pneumonia; the other deliveries were performed after the patients were cured of their pneumonia with COVID-19. We do not have the data necessary to assess the risks to the newborn from per vaginal delivery to those of cesarean section. Seven (77.8%) fetuses were alive with an APGAR score greater than 7 in the first minute and we have two neonatal deaths. It was difficult to formally incriminate the SARS-CoV-2 virus, but it is possible that these complications reflect poor tolerance to hypoxia (21). Nasopharyngeal swabs were taken from newborns no later than 48 hours after birth and all were negative; no newborn presented with symptoms during admission and required pediatric care. Huijun et al (7) did not find neonatal complications in his series of nine births, all performed by cesarean section.

We did not find any association between the occurrence of severe COVID-19 pneumonia and the unfavorable prognosis of pregnancy in our series. This could be justified by the limited sample size and also by the fact that the majority of pregnancies are in progress. The patients were recruited every

trimester of pregnancy and the causal relationship of COVID-19 on the unfavorable outcome of the pregnancy seems difficult to establish.

Conclusion

The small size of our sample does not allow definitive conclusions to be drawn. The follow-up of the remaining pregnant women will allow us to propose new results for the next work.

Declarations

Ethics approval and consent to participate

The ethical approval has been obtained from the ethics committee of the Central Hospital of Yaounde. We didn't need obtain informed consent from a parent or guardian as our patients were all over the age of 18.

Consent for publication

Not Applicable

Availability of data and materials

The datasets generated and / or analyzed during the current study are not accessible to the public because they are the subject of ongoing research. But are available from the corresponding author on reasonable request.

Competing Interests

None declared

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No funding was obtained for this study.

Author's contributions

MN Dingom and ES originated and designed the study. MN, AA, YW contributed to data collection and clean. AN and JK conducted data analysis. MD, ES, GN, AN interpreted the findings and drafted the manuscript. MN, ES, FE, AA, YW, JN, PS, CS, BW, GL, JB, FE, FF, GN, JF, RT, PO, PF, RM took care of the patients during their hospitalization. All authors have read and approved the manuscript.

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Figures

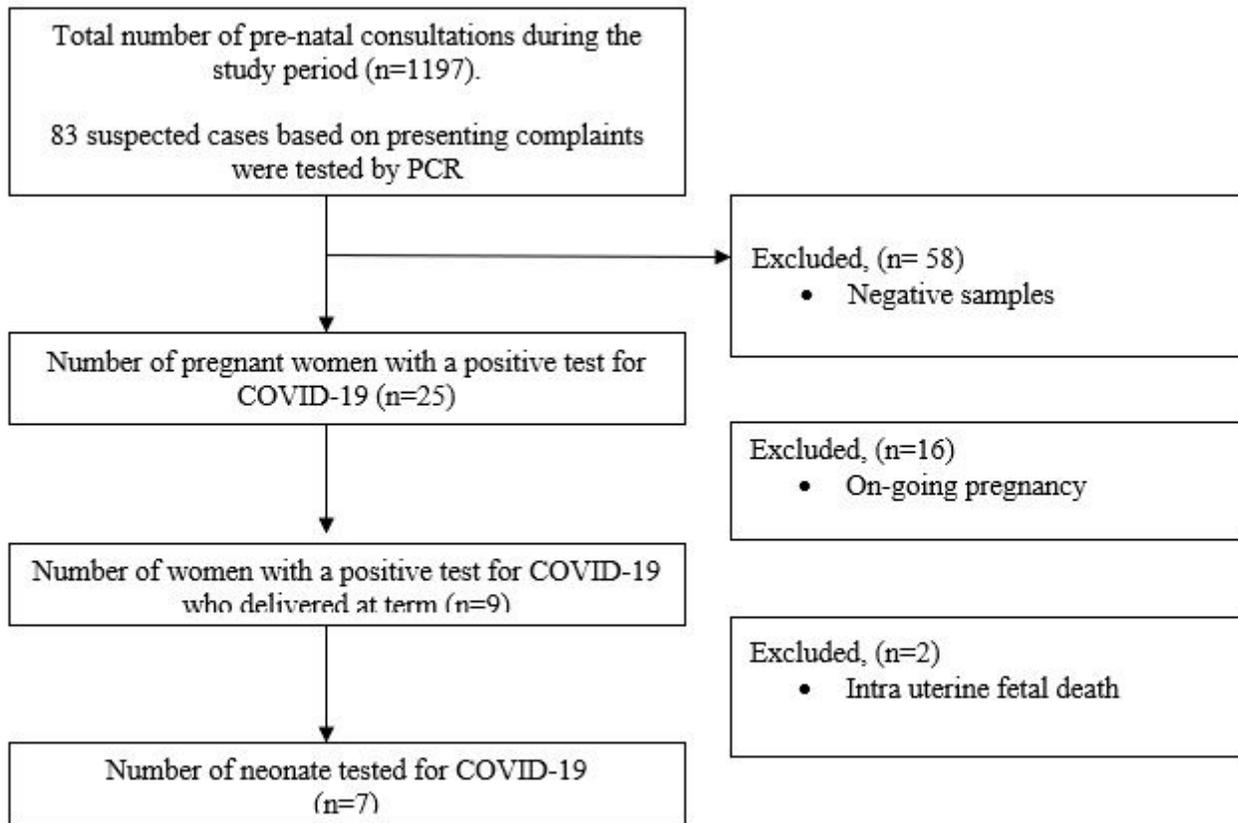


Figure 1

Description of study procedure and number of women and neonates followed-up

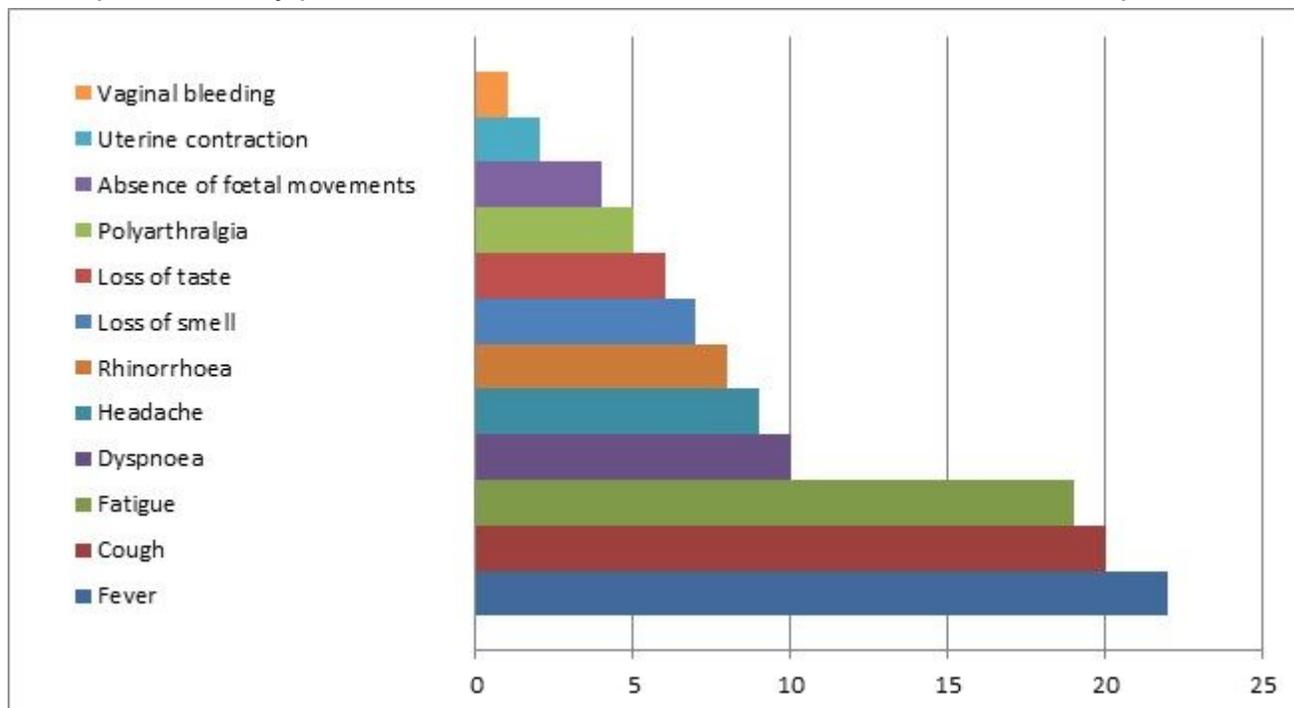


Figure 2

Presenting symptoms of the study participants presenting with COVID-19