


## Pregnancy and COVID-19: Gestational profile of patients infected with SARS-Cov-2

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### ABSTRACT

COVID-19 presents clinical manifestations from asymptomatic cases to deaths and causes vulnerability among several groups, pregnant women being one of them. Complications were related, as well as fetal death that seems to be

associated with contamination by sars-cov-2. Method: this was a descriptive study of the case series type, which aims to identify the probability of occurrence of a disease or the clinical circumstance or the event that is the subject of the research. The data obtained after applying the semi-structured questionnaire to 61 out of a total of 132 pregnant women were descriptively tabulated and analyzed using a statistical program. Results: 53% of pregnant women had health conditions related to pregnancy: systemic arterial hypertension, diabetes mellitus, placenta previa, urinary tract infection, and placental displacement, among others. At the end of the pregnancy, 88.5% of the deliveries were full-term, 3.3% were premature and 8.2% did not complete the pregnancy due to miscarriage or fetal death. It was also found that the percentage of death was 2.3%. Conclusion: it was observed that the vast majority of the public interviewed in this study did not have clinical complications after infection with covid-19. The gestational outcome came to term, but a small group had maternal and perinatal sequelae.

**Keywords:** Pregnancy, covid-19, epidemiological profile.

## 1 INTRODUCTION

At the end of 2019, a new virus called Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) was discovered in the city of Wuhan, China, responsible for a disease that causes respiratory symptoms in patients, the Coronavirus Disease- 2019 (COVID-19). In mid-March 2020, the World Health Organization (WHO) declared the COVID-19 pandemic, due to the high transmissibility of the virus, which quickly reached five continents and the state of public calamity that the disease caused throughout the world.<sup>1,2</sup>

COVID-19 is a disease with a variety of clinical manifestations, ranging from asymptomatic cases and mild infections of the upper airways to acute conditions that may involve pneumonia and respiratory failure, which may culminate in the patient's death<sup>1</sup>.

Due to several factors, some groups have a higher risk of developing the disease in its most severe form and with higher mortality, among them are the elderly, people with chronic systemic comorbidities (systemic arterial hypertension - SAH, diabetes mellitus - DM), among others and

immunosuppressed. Pregnant women also tend to be classified as more susceptible, since the physiological changes suffered by women during pregnancy can make them more prone to developing lung infections in which the outcome is worse than it would be in a non-pregnant woman<sup>3,1,2</sup>.

Some of the physiological changes that occur in the pregnant woman's body are lung volume and smaller residual and functional volumes due to diaphragmatic elevation, increase in the transverse diameter of the rib cage, airway edema, increased rate of oxygen consumption, state of hypercoagulation and altered cellular immunity<sup>1,4</sup>.

Experiences with complicated pregnancies in previous outbreaks that were caused by infections with other types of coronavirus, such as in the case of a severe acute respiratory syndrome caused by SARS-CoV in 2003 and middle east respiratory syndrome caused by MERS-CoV in 2012, corroborate the concern about the increase in the number of pregnant women who contract infections by SARS-CoV-2 and who, as a result, have a high risk of having a miscarriage, premature birth, and morbidity or mortality in the fetus and newborn<sup>1,5,2</sup>.

Due to the importance of the subject and the high number of pregnant women infected with SARS-CoV-2, studies on the impact of COVID-19 on pregnant women have already been carried out, but it is still characterized as a subject that requires further analysis and discussion<sup>1,2</sup>.

The objective of the study was to describe the clinical and epidemiological aspects related to the profile and gestational outcome of patients infected with SARS-CoV-2, from a municipality in the north of Minas Gerais.

## **2 METHOD**

This is a descriptive study of the case series type, which aims to identify the probability of occurrence of a disease or the clinical circumstance or the event that is the subject of the research<sup>6</sup>.

The initial data were obtained through the database of the municipal health department of a municipality in the north of Minas Gerais, from registered pregnant women who had COVID-19 during the gestational period, between March 2020 and August 2021, and application of a semi-structured questionnaire by telephone.

In the aforementioned period, the municipality had 2,801 pregnant women registered in the Family Health teams, and the specific epidemiological data for the study comprised a total of 132 pregnant women.

Case series and case reports are generally initial studies for the elaboration of larger studies and are important in the identification of epidemics, description of characteristics of new diseases, the elaboration of hypotheses about possible causes of diseases, description of results of proposed therapies for rare diseases and rare adverse effects in common diseases<sup>7</sup>.

As for the inclusion criteria, all pregnant women residing in Montes Claros - MG with a laboratory diagnosis of infection by COVID-19, in the period covered by the research and who agreed to participate in the research through a term of free and informed consent, sent through a link via email or instant messaging application.

The exclusion criteria excluded pregnant women who were not found by telephone contact after three consecutive attempts on alternate days.

The investigation of the gestational profile and outcome of pregnancies of women who had COVID-19 was carried out through the collection of data obtained from the notifications contained in the database provided by the epidemiology sector of the municipal health department and the application of the semi-structured questionnaire carried out directly to the participants via phone calls.

The data obtained after applying the semi-structured questionnaire were descriptively tabulated and analyzed using the statistical program Statistical Package for the Social Sciences (SPSS) version 22.0, which allowed the construction of graphs and tables, subsidizing the analysis of the collected data, to answer the objectives proposed by this study.

This research was submitted and approved by the Research Ethics Committee under opinion n° 4,838,997, following the guiding ethical standards of Resolution n° 466 of December 12, 2012, of the National Health Council.

### **3 RESULTS**

To determine the profile and gestational outcome of patients infected with SARS-Cov-2, data were obtained from 132 pregnant women who tested positive for COVID-19, from which it was possible to apply 61 semi-structured questionnaires.

Of the 68 pregnant women not included in the study, the reasons included: lack of response to calls, not authorizing the application of the questionnaire, unavailable or non-existent phone numbers, and pregnant women who did not have COVID-19 during pregnancy because they underwent the test before pregnancy.

Patients who died (03) had their epidemiological data from the questionnaire included, according to the information contained in the investigation form of flu syndrome suspected of disease caused by the coronavirus 2019 - COVID-19, of compulsory notification and were added to the total of the research, adding 64 cases.

The average age of pregnant women was 30.2 years, and the most prevalent age group in the study was 29 to 33 years, corresponding to approximately 44.3% of the total. Regarding marital status, 50% are married, 39.1% are single and 6.3% have a stable relationship. The predominant education of participants with complete secondary education, comprised 57.8% (TAB 1).

Table 1 – Level of education of pregnant women with COVID-19 in Montes Claros- MG – Brazil.

<b>Level of education</b>	<b>Frequency</b>	<b>Percentage</b>
Incomplete fundamental	1	1,6%
Full medium	37	57,8%
Incomplete high school	4	6,3%
Postgraduate	1	1,6%
Graduated	13	20,3%
Incomplete higher	5	7,8%
Missing	3	4,7%
<b>Total</b>	<b>64</b>	<b>100</b>

Source: Data consolidated by the authors themselves

As for the type of prenatal care, 57.8% of the participants had regular-risk prenatal care and 37.5% declared that prenatal care was high-risk.

Through the analysis of the data obtained, it was observed that only 6.3% of the pregnant women were asymptomatic at the time of care and notification for suspected cases of COVID-19, and among those who presented symptoms, 10% required hospital treatment, and 7, 8% represent the rate of those who needed to use oxygen.

Regarding complications after the diagnosis of COVID-19, of the 64 pregnant women in the study, 5 reported that they had complications from the disease (TAB 2).

Table 2: Pre-existing conditions and pregnancy complications after COVID-19 infection. Montes Claros – MG – Brazil.

<b>Pregnant women</b>	<b>Preexisting diseases</b>	<b>Patients with complications after COVID-19 infection</b>		<b>Pregnancy-related health conditions</b>
Yes	5		5	34
No	58		55	27
Uninformed	01		1	-
Missing (deaths)	-		03	03
<b>Total</b>	<b>64</b>		<b>64</b>	<b>64</b>

Source: Data consolidated by the authors themselves.

In this series, patients who had pre-existing diseases during pregnancy accounted for 3.1%, having reported chronic diseases such as SAH and DM, with one pregnant woman for each disease respectively, totaling two pregnant women.

Among the pregnant women participating in the study, 8.3% responded that they had complications during pregnancy after becoming infected with COVID-19, with more than one complication being described by the same pregnant woman (TAB 3).

More than half of the interviewees (53% responded that they had health conditions related to pregnancy, namely: SAH, DM, placenta previa, urinary tract infection - UTI, and placental displacement, among others.

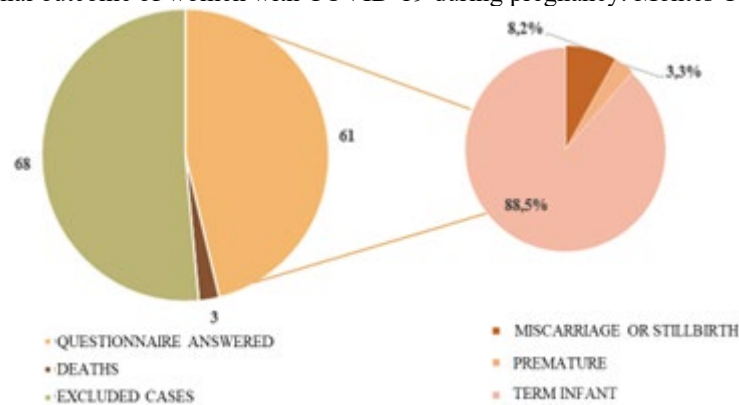
Table 3 – Clinical complications in pregnancy after COVID-19 infection. Minas Gerais – MG – Brazil.

Clinical Complications	Frequency
Fetal distress	1
Tachycardia	1
Hypertension	2
Gestational diabetes	1
breathing difficulty	1
Memory loss	1
Uterine growth restriction	1
Baby growth limitation	1
Delivery anticipation	1
Loss of amniotic fluid	1
<b>Total</b>	<b>11</b>

Source: Data consolidated by the authors themselves

When addressing the delivery and the outcome of the pregnancy, it was observed that 88.5% of the deliveries were full-term, 3.3% had premature labor and 8.2% of the interviewees did not complete the pregnancy due to abortion or fetal death. It was also found that the percentage of deaths in the study was 2.3% (Graph 1).

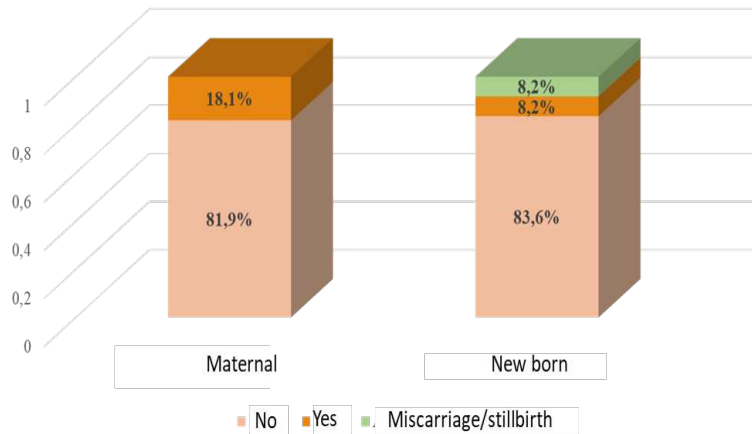
Graph 1: Gestational outcome of women with COVID-19 during pregnancy. Montes Claros – MG – Brazil.



Source: Data consolidated by the authors themselves

In the case series analyzed, the responses of the interviewees on maternal and perinatal sequelae due to the COVID-19 infection stand out, with 18.1% of the pregnant women and 8.2% of the newborns having sequelae (Graph 2).

Graph 2: Maternal and perinatal sequelae after COVID-19 infection. Montes Claros – MG – Brazil.



Source: Data consolidated by the authors themselves

Of the reported maternal sequelae, we can highlight and quantify their frequency in the study: pain in the joints and lower limbs (2), anosmia (1), anxiety (2), difficulty breathing (2), and memory loss (3). The consequences for the children were: heart problems (1) and low birth weight (1).

#### 4 DISCUSSIONS

The clinical characteristics of pregnant women with COVID-19 can vary from asymptomatic cases to more severe cases, often requiring hospital intervention. The percentage of asymptomatic pregnant women in the present study was 6.3%, which is in line with data from the literature that points to a study that evaluated patients with clinical and laboratory diagnoses, and identified that up to a third of the sample did not present symptoms of the disease. SARSCOV-28 infection.

The clinical condition of the disease among pregnant women is still unpredictable, but it is believed that COVID-19 infection, in this life cycle, can lead to an unfavorable clinical evolution and obstetric outcome, causing fetal distress, spontaneous abortion, respiratory distress, prematurity and greater need for surgical delivery<sup>9</sup>.

So far, there is no scientific evidence to justify the differentiated management of pregnant women with COVID-19, it is recommended that the following be considered during the evaluation: gestational age, maternal condition, and fetal viability. Thus, suspected or confirmed pregnant women should be treated with supportive therapies, taking into account the physiological adaptations of pregnancy<sup>10</sup>.

The rate of pregnant women who had some complication after infection with COVID-19 was 7.8%, with reports of fetal distress, tachycardia, hypertension, gestational diabetes, respiratory distress, memory loss, restriction of uterine growth, anticipation of childbirth, and decrease in amniotic fluid. Regarding the use of oxygen treatment, it was 3.1%, a percentage lower than the 11.68% found in another study<sup>11</sup>.

The rate of miscarriage or fetal death represented 8.2%, a higher value when compared to a recent study that showed a rate of 1.4%<sup>8</sup>. On the other hand, about prematurity, the rate found in the present study was 3.3 %, which is lower when compared to a literature review that showed an index of 18.52%<sup>11</sup>, which is justified by the association between the increased incidence of prematurity in women with COVID-19, when compared to women without affected by disease<sup>2</sup>.

It is known that the situation of maternal mortality in Brazil is critical, it is not recent and carries socioeconomic and racial issues<sup>10</sup>. In the present study, it was observed that the death rate from COVID-19 in pregnant women was 2.3%, a figure close to the 2.7% observed in the review that addressed 39 studies involving a total of 1,316 pregnant women<sup>12</sup>.

The Ministry of Health, through FIOCRUZ, points out that until the beginning of the pandemic, Brazil had a maternal death ratio of around 55 deaths per 100,000 live births, which corresponds to 0.06%. In the first months of the pandemic, cases of maternal deaths began to be reported, and the lethality rate due to COVID in Brazil at the time of publication stood at a rate of 7.2% for pregnant women, more than double the lethality rate for the general population of the country, which was 2.8%<sup>13</sup>.

## **5 CONCLUSIONS**

It was observed that the vast majority of the public interviewed in this study did not present clinical complications after infection with COVID-19., with the gestational outcome of term deliveries, with a small incidence of abortion and fetal death, followed by premature births.

Despite the low incidence, some maternal sequelae after infection with SARSCOV-2 were identified, such as pain in the joints and lower limbs, anosmia, anxiety, difficulty breathing, and memory loss; as well as fetal ones, such as cardiac alterations and low birth weight.

Given this, it is concluded that uncertainties about COVID-19 in the gestational period persist, requiring further studies with larger samples so that it is possible to analyze, with greater accuracy, the conditions, clinical evolutions, and sequelae manifested in this specific public.

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