

**Republic of Iraq**  
**Ministry of Higher Education**  
**And Scientific Research**  
**University of Diyala**  
**College of Medicin**



## **Effects of COVID-19 ON PREGNANCY**

**A project submitted to the council of College of Medicine / University  
of Diyala in Partial fulfillment of the Requirements for the Degree of  
bachelor**

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**2021-2022**

## **Acknowledgments**

**I owe a great many thanks to the great people who helped and supported me to complete this project. My deepest thanks to (Dr.Inaam Faisal Mohammed) my teacher and supervisor for guiding me in the article by correcting the mistakes and giving his valuable opinions in many aspect in both scientific facts and literature ones. I hope all the best and successes to her in her career and future.**

## Abstract

### Background

Since the World Health Organization (WHO) declared coronavirus infection (COVID-19) a public health emergency of international importance in January 2020, there have been many concerns about pregnant women and the potential effects of this emergency with catastrophic outcomes in many countries. Information about COVID-19 and pregnancy is scarce and spreads in a few case series. The current review provides a brief analysis of COVID-19, pregnancy in the era of COVID-19, and the effects of COVID-19 on pregnancy

**Conclusion:** We found that pregnant women infected with the Corona virus were exposed to problems that affected the fetus, as all pregnant women in the third trimester were exposed to early deliveries, and 16.7% of pregnant women in the first trimester experienced miscarriage and pregnancy loss. As for pregnant women in the second trimester, we did not notice there is an effect.

**Aim of study:** To assess the impact of infection with the Corona virus on pregnant women and its impact on pregnancy and the fetus

**Patients, Materials & Methods:** This prospective study was done at the gynecology outpatient. Clinic-AL-Batool-Teaching Hospital –Dyjala – Iraq. During March 2022. A total of 20 pregnant ladies with confirm diagnosis of COVID-19 were enrolled. The patient age range from 20 to 40 years with different gestational age.

### Conclusion

Corona virus disease has many effects on pregnancy on the mother and fetus.

At the level of the Maternal, it leads to classical symptoms (fever, cough, diarrhea, shortness of breath, headache), but there is nothing that draws attention when comparing with women who are not pregnant. We also found the emergence of other symptoms (cramps, vaginal bleeding and vaginal discharge).

But at the level of the fetus, the Corona virus had an effect on pregnancy In this study, we found that 15% of pregnant women infected with COVID-19 were exposed to premature birth, and this percentage represented all pregnant women in the third trimester of pregnancy from the studied cases, and 5% of the cases were exposed Pregnant women had abortions, and they were among those in the first trimester of pregnancy, and this percentage represents 16.7 of the pregnant women in the first trimester that were studied. We note that pregnant women from the second trimester of pregnancy did not suffer from any problems.

**Key word:** COVID-19, COVID-19 and pregnancy, symptoms of COVID-19 with pregnancy, preterm labor.

## Introduction

Coronaviruses (CoV) are a large family of viruses that cause respiratory illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans.<sup>[1,2]</sup>

Coronaviruses are zoonotic, meaning they are transmitted between animals and people.

The risk of pregnant women contracting COVID-19 is generally low. However, pregnant women or those who have recently given birth are more likely to develop severe illness with COVID-19. Severe illness may require hospitalization, intensive care, or placement on a ventilator to assist with breathing. Pregnant women infected with Covid 19 are also more likely to give birth before the beginning of the 37th week of pregnancy (premature birth), and their risk of experiencing some problems such as pregnancy loss may increase.<sup>[3,4]</sup>

When infected the human it may causes many symptoms ranging from mild to high sever

The most common clinical symptoms of COVID-19 in the general population are fever (91%), cough (67%), fatigue (51%), and dyspnea (30%). Fever (68%) and cough (34%) .<sup>[6]</sup>

Are also the most common symptoms in pregnant women with COVID-19, with other symptoms including dyspnea (12%), diarrhea (6%), and malaise (12%) .<sup>[5,6]</sup>

Pregnant women may be susceptible to developing more severe symptoms after infection with respiratory viruses, due to physiological changes of the immune and cardiopulmonary systems during pregnancy

A pregnant woman has lower immunity as a way of preventing the fetus from being rejected. Thus, she is more susceptible to covid\_19 complications. Pre-existing illnesses, such as diabetes, asthma or heart disease, further increase this risk Pneumonia is the most common complication that can arise from covid\_19.<sup>[5]</sup>

Fever may lead to congenital abnormalities in the fetus.

And symptoms of the digestive system (diarrhea, vomiting...) can lead to pregnancy loss preterm labor

Also, other symptoms can lead to a uterine growth restriction

And for maternal may cause more sever symptom due to low immunity during pregnancy also treatment and management of the disease will effects on the fetus.<sup>[5]</sup>

## Patients, Materials & Methods:

This prospective study was done at the gynecology outpatient. Clinic-AL-Batool-Teaching Hospital –Dyiala – Iraq. During March 2022. A total of 20 pregnant ladies with confirm diagnosis of COVID-19 were enrolled. The patent age range from 20 to 40 years with different gestational age.

The diagnosis of COVID-19 was based on the Iraqi and WHO care guide lines.

## Results

### Age of maternal

The cases studied were 20 cases ranging in age from 20 to 40 years and they can be distributed as in the following table

| age            | 20-25 | 26-30 | 31-36 | 36-40 |
|----------------|-------|-------|-------|-------|
| Number of case | 4     | 4     | 8     | 4     |
| Percent %      | 20%   | 20%   | 40%   | 20%   |

### Gestational age:

We found the pregnant that infected with the first trimester was 30%, the rate of infection during the second trimester was 55%, and the percentage of infection during the third trimester was 15%. Where we note that the second trimester has the largest percentage of infected category, while the third trimester was the least infected category

| gestational age  |           |         |
|------------------|-----------|---------|
|                  | Frequency | Percent |
| first trimester  | 6         | 30.0    |
| second trimester | 11        | 55.0    |
| third trimester  | 3         | 15.0    |
| Total            | 20        | 100.0   |

This table shows the distribution of gestational age and the incidence of each of them with the COVID-19 infection

### Fever

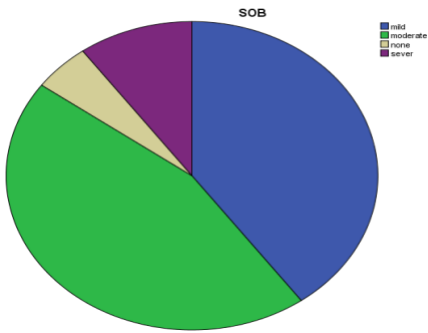
| fever    |           |         |
|----------|-----------|---------|
| Severity | Frequency | Percent |
| mild     | 8         | 40.0%   |
| moderate | 9         | 45.0%   |
| sever    | 3         | 15.0%   |

This show the severity of the (**fever**) and the percentage

Given that the most prominent sign of COVID-19 is fever, we said that the fever was severe in only 15%, while 40% were mild and 45% were moderate.

### Shortness of Breath

When looking at shortness of breath, we find that it was between mild and moderate severity, as 40% of patients were of mild severity, 45% of them were of moderate severity, while 10% of them were severe, and 5% of them did not show symptoms of shortness of breath.

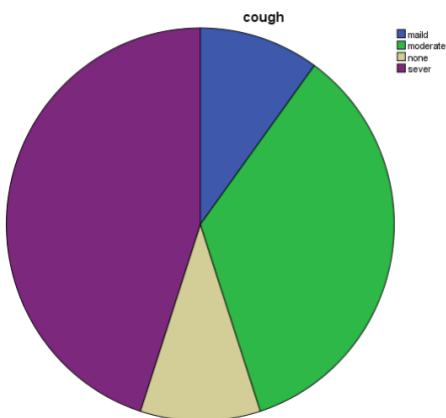


| Severity | Frequency | Percent |
|----------|-----------|---------|
| mild     | 8         | 40.0    |
| moderate | 9         | 45.0    |
| none     | 1         | 5.0     |
| sever    | 2         | 10.0    |

This show the severity of the (shortness of breath) and the percentage

## Cough

From a study of cough cases, it was found that cases of severe cough constituted 45%, while cases of moderate severity constituted 35% and mild cases constituted 10%, while 10% of the infected women did not suffer from coughing.



| cough    |           |         |
|----------|-----------|---------|
|          | Frequency | Percent |
| mild     | 2         | 10.0    |
| moderate | 7         | 35.0    |
| none     | 2         | 10.0    |
| sever    | 9         | 45.0    |

This show the severity of the (**cough**) and the percentage

## Diarrhea

When observing cases of diarrhea among women, we note that (50%) did not suffer from diarrhea, while (10%) of cases suffered from mild diarrhea, (20%) from moderate diarrhea, and (20%) from severe diarrhea.

| Diarrhea     |           |              |
|--------------|-----------|--------------|
|              | Frequency | Percent      |
| mild         | 6         | 30.0         |
| none         | 10        | 50.0         |
| sever        | 4         | 20.0         |
| <b>Total</b> | <b>20</b> | <b>100.0</b> |

This show the severity of the (**diarrhea**) and the percentage

## Cramps

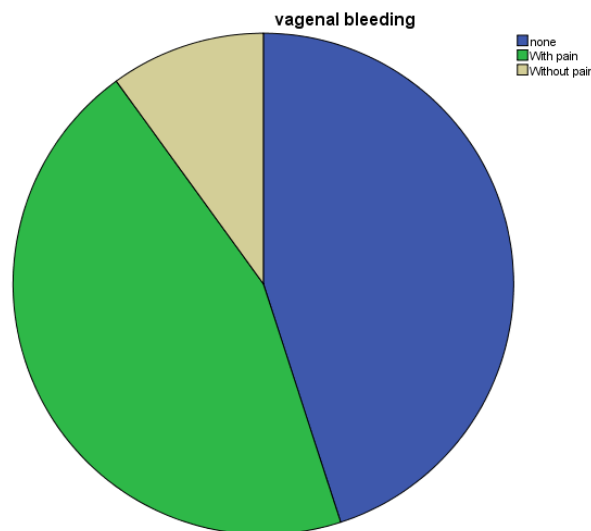
We found pregnancy cramps with Covid patients, as we find that 15% of the patients suffer from mild cramps, 60% of the patients suffer from cramps of moderate severity, and 15% suffer from severe cramps, while 10% do not have any cramps.

| cramping |           |         |
|----------|-----------|---------|
|          | Frequency | Percent |
| mild     | 3         | 15.0    |
| moderate | 12        | 60.0    |
| none     | 2         | 10.0    |
| sever    | 3         | 15.0    |
| Total    | 20        | 100.0   |

This show the severity of the (cramping) and the percentage

## Vaginal bleeding

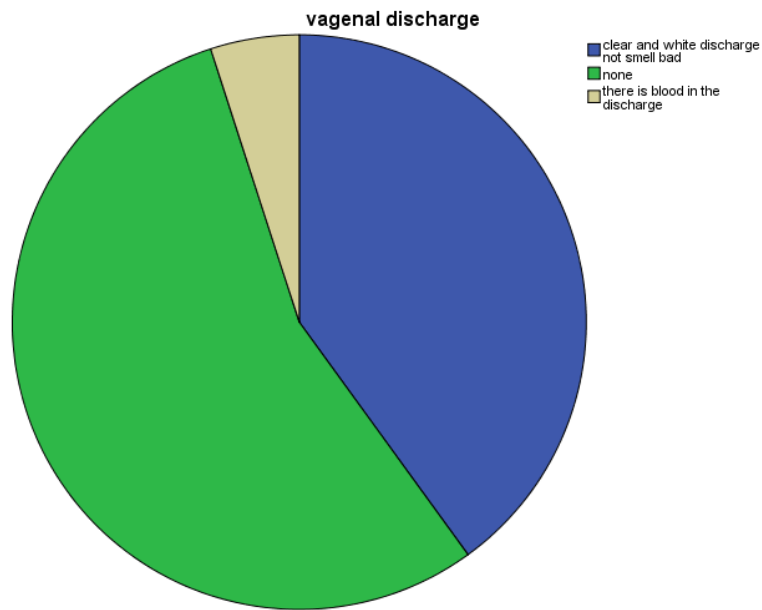
It appears that 45% of the infected pregnant women did not suffer from vaginal bleeding, and 10% of the infected pregnant women had vaginal bleeding without pain, while 45% had vaginal bleeding with pain.



This show the severity of the (vagenal bleeding) and the percentage

## Vaginal discharge

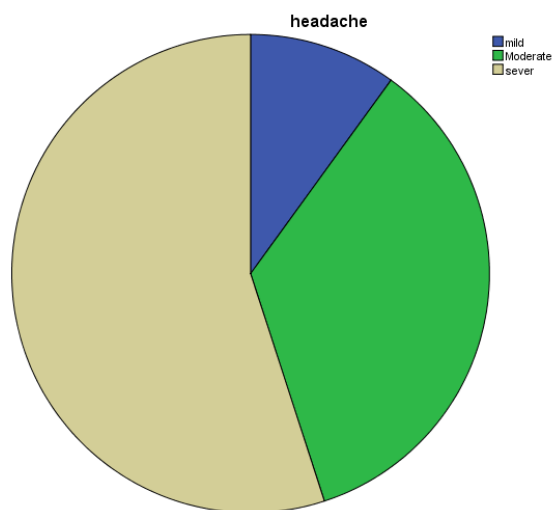
It shows that 55% did not suffer from any vaginal secretions, 40% were suffering from clear and white discharge not smell bad, while only 5% were suffering from blood in the discharge



This show the severity of the (vaginal discharge) and the percentage

## Headaches

Pregnant women infected with COVID-19 suffered from headaches in varying proportions, as 55% of the infected pregnant women suffered from severe pain, while 35% were suffering from moderate severity and 10% suffered from mild pain.

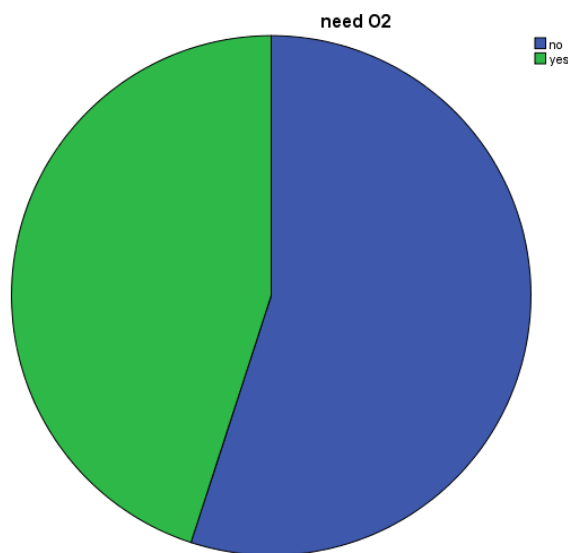


This show the severity of the (headache) and the percentage



## Need O2

This table shows the percentage of pregnant women infected with the Corona virus who needed to enter the hospital or obtain medical care. The percentage of pregnant women who needed care or access to oxygen was 45%, while 55% of them did not need that.



This show the Percent of pregnancy that (**need O<sub>2</sub> or not**)

## Fetus complication

In this study, we found that 80% of pregnant women did not suffer from problems threatening pregnancy or the fetus, while (15%) of pregnant women infected with COVID-19 were exposed to premature birth, and this percentage represented all pregnant women in the third trimester of pregnancy from the studied cases, and (5%) of the cases were exposed Pregnant women had abortions, and they were among those in the first trimester of pregnancy, and this percentage represents (16.7%) of the pregnant women in the first trimester that were studied. We note that pregnant women from the second trimester of pregnancy did not suffer from any problems.

| Fetus complication |           |         |
|--------------------|-----------|---------|
| complication       | Frequency | Percent |
| abortion           | 1         | 5.0     |
| none               | 16        | 80.0    |
| preterm labor      | 3         | 15.0    |
| Total              | 20        | 100.0   |

This table show the complication that effects at the fetus and pregnant status.

## Discussion

**Fever:** Given that the most prominent sign of COVID-19 is fever, total case that study suffering from fever. The fever was severe in only (15%), while (40%) were mild and (45%) were moderate.

**Shortness of Breath:** When looking at shortness of breath, we find that it was between mild and moderate severity, as (40%) of patients were of mild severity, (45%) of them were of moderate severity, while (10%) of them were severe, (5%) of them did not show symptoms of shortness of breath.

**Cough:** From a study of cough cases, it was found that cases of severe cough constituted (45%), while cases of moderate severity constituted 35% and mild cases constituted (10%), while (10%) of the infected women did not suffer from coughing.

**Diarrhea:** When observing cases of diarrhea among women, we note that (50%) did not suffer from diarrhea, while (10%) of cases suffered from mild diarrhea, (20%) from moderate diarrhea, and (20%) from severe diarrhea.

In other studies of Elsevier Public Health Emergency Collection

The most common clinical symptoms of COVID-19 in the general population are **fever (91%), cough (67%),** and **shortness of breath (30%)** <sup>[6]</sup> In the study **Fever (98%)** and **cough (55%)** are also the most common symptoms in pregnant women with COVID-19, with other symptoms including dyspnea (10%), **diarrhea (20%)** <sup>[7]</sup>

When compared the case of infective pregnant with cases of infection in non-pregnant women, we note that there is no significant difference in the case of fever according to Summary of a Report of 72 314 Cases from the **Chinese Center for Disease Control and Prevention**

The latest research indicates that the vast majority of COVID-19 cases are in the least

Severe class:

- Light to medium: 80%.
- Severe to critical: 20%. <sup>[10]</sup>

In the (Acta obstetrica et gynecologica Scandinavia) journal [eighteen articles reporting data from 108 pregnancies between 8 December 2019 and 1 April 2020 were included in the current study. Most reports described women presenting in the third trimester with **fever (68%)** and **coughing (34%)** and **diarrhea (6%)** <sup>[12]</sup>

In other study for **University of California San Francisco** the percent of **cough was (20%)** <sup>[13]</sup>

## Cramps

We found pregnancy cramps with Covid patients, as we find that 15% of the patients suffer from mild cramps, 60% of the patients suffer from cramps of moderate severity, and 15% suffer from severe cramps, while 10% do not have any cramps.

Says Jingwen Hou, M.D., Ph.D., an OB-GYN specializing in reproductive endocrinology and infertility at Kaiser Permanente in Hawaii. While many women don't show any signs of conception, about 30 percent experience implantation cramps. Sometimes implantation cramps are accompanied by light pink or brown spotting; you can also have implantation bleeding without cramps.<sup>[16]</sup>

## Vaginal bleeding

It appears that 45% of the infected pregnant women did not suffer from vaginal bleeding, and 10% of the infected pregnant women had vaginal bleeding without pain, while 45% had vaginal bleeding with pain.

Damage of placenta may be the cause dependent on the article of Web MD news

[The [coronavirus](#) causes "widespread and severe" destruction of the [placenta](#) that deprives the fetus of oxygen, a team of 44 researchers in 12 countries concluded after examining 64 stillbirths and four neonatal deaths in which the placenta was infected with the virus. They found that such damage occurs in a small percentage of pregnant women with COVID-19, and that all the women affected had not been vaccinated against the disease.<sup>[14]</sup> ]

## Vaginal discharge

It shows that 55% did not suffer from any vaginal secretions, 40% were suffering from clear and white discharge not smell bad, while only 5% were suffering from blood in the discharge

Pregnancy causes changes in vaginal discharge, which can vary in color, texture, and volume. An increase in vaginal discharge is often one of the earliest signs of pregnancy. Some changes in color are also normal, while others may indicate infection or another problem.

Color is one of the most noticeable changes that can occur. Discharge can be:

- clear or milky white
- white and lumpy
- green or yellow
- gray
- brown
- pink
- red

So the discharge may be normal or don't cause by COVID-19 Infection <sup>[15]</sup>

## Headaches

Pregnant women infected with Covid suffered from headaches in varying proportions, as 55% of the infected pregnant women suffered from severe pain, while 35% were suffering from moderate severity and 10% suffered from mild pain.

A headache can also be a symptom of COVID-19. In these cases, headaches have been [reported Trusted Source](#) as occurring prior to the onset of more typical COVID-19 symptoms, like fever and cough.

Studies have begun to address how common a headache is with COVID-19. The exact numbers can vary based on the population being studied. Research has found it occurred in around [11 to 34 percent Trusted Source](#) of people hospitalized with COVID-19. <sup>[17]</sup>

### Need O2

This table shows the percentage of pregnant women infected with the Corona virus who needed to enter the hospital or obtain medical care. The percentage of pregnant women who needed care or access to oxygen was 45%, while 55% of them did not need that.

The study includes 54 pregnant women with confirmed (n=38) and suspected (n=16) coronavirus disease 2019. Oxygen support was required for 13 of 54 women (24.1%), including high-flow oxygen (n=2), noninvasive (n=1) and invasive (n=3) mechanical ventilation, and extracorporeal membrane oxygenation (n=1). Of these, 3, aged 35 years or older with positive test result for severe acute respiratory syndrome coronavirus 2 using reverse transcription polymerase chain reaction, had respiratory failure requiring indicated delivery before 29 weeks' gestation. All 3 women were overweight or obese, and 2 had an additional comorbidity. <sup>[18]</sup>

## Fetus complication and maternal outcomes

In this study, we found that 80% of pregnant women did not suffer from problems threatening pregnancy or the fetus, while 15% of pregnant women infected with Covid were exposed to premature birth, and this percentage represented all pregnant women in the third trimester of pregnancy from the studied cases, and 5% of the cases were exposed Pregnant women had abortions, and they were among those in the first trimester of pregnancy, and this percentage represents 16.7 of the pregnant women in the first trimester that were studied. We note that pregnant women from the second trimester of pregnancy did not suffer from any problems.

The study includes 54 pregnant women with confirmed (n=38) and suspected (n=16) coronavirus disease 2019. Of these, 32 had an ongoing pregnancy, 1 had a miscarriage, and 21 had live births: 12 vaginal and 9 cesarean deliveries. Among the women who gave birth, preterm deliveries were medically indicated for their coronavirus disease 2019-related condition for 5 of 21 women (23.8%): 3 (14.3%) before 32 weeks' gestation and 2 (9.5%) before 28 weeks' gestation. <sup>[18]</sup>

In other study for *Physiol Rev Journal* about **Maternal outcomes**

### First trimester

Li et al. reported that four of seven pregnant women with SARS presenting in the first trimester had spontaneous miscarriages, and two had elective terminations. The only newborn survivor was delivered at term, and no anomalies were reported <sup>[19]</sup>.

### **Second/third-trimester**

Lam et al. suggested that pregnant women with SARS had higher rate of maternal mortality, intubation and ICU admission than non-pregnant women with SARS, but that transmission of the virus to the infant did not occur [20]. More complications such as miscarriage, preterm delivery, and small for gestational age neonates, have also been reported. However, one study reported no increases in the risks of spontaneous abortion and spontaneous preterm birth in pregnant COVID-19 women [21].

## **Conclusion**

Corona virus disease has many effects on pregnancy on the mother and fetus.

At the level of the mother, it leads to the emergence of the well-known symptoms (fever, cough, diarrhea, shortness of breath, headache), but there is nothing that draws attention when comparing with women who are not pregnant. We also found the emergence of other symptoms (cramps, vaginal bleeding and vaginal secretions).

But at the level of the fetus, the Corona virus had an effect on pregnancy. In this study, we found that 15% of pregnant women infected with COVID-19 were exposed to premature birth, and this percentage represented all pregnant women in the third trimester of pregnancy from the studied cases, and 5% of the cases were exposed. Pregnant women had abortions, and they were among those in the first trimester of pregnancy, and this percentage represents 16.7% of the pregnant women in the first trimester that were studied. We note that pregnant women from the second trimester of pregnancy did not suffer from any problems.

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