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RESEARCH

Clinical Characteristics and Outcomes of Pregnant Women with Covid-19 in Gadjah Mada Academic Hospital

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Abstract

Introduction: This study aimed to determine the characteristics of pregnant women diagnosed with Covid-19 and hospitalized at the Gadjah Mada University Academic Hospital.

Methods: The method in this study is a descriptive research method to illustrate a situation objectively and without intervention. All pregnant women who seek treatment and are included in the Gadjah Mada University Academic Hospital study are diagnosed with Covid-19 by RT-PCR.

Results: The object of this study were 210 pregnant female patients diagnosed with Covid-19 until August 2021. The third trimester dominated the gestational age, and most of them had no symptoms (asymptomatic). The most dominant symptom was cough. Most of the patients came with referrals from the puskesmas on the grounds of pregnancy complaints. Most of them are puskesmas referrals with seven days of treatment in the hospital. Most of the delivery of pregnant women with Covid-19 was by abdominal delivery.

Conclusion: The clinical characteristics and outcomes of pregnant women with Covid-19 who underwent treatment varied. Most of them went home from treatment due to improved conditions or had given birth and continued to self-isolate at home. Nevertheless, it remains a concern that Covid-19 is undoubtedly one of the factors that can cause death in pregnant women.

Keywords: Clinical characteristics; Outcomes of Pregnant Women; Covid-19



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INTRODUCTION

The outbreak of Coronavirus-19 (Covid 19), designated as a pandemic by WHO since March 2020, has caused global problems, including in Indonesia. Covid 19 is caused by infection with the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS CoV-2). This virus was identified initially in Wuhan, China which then spread rapidly globally into a pandemic infecting millions of individuals worldwide.¹ Individuals infected with Covid-19 may show no symptoms at all (asymptomatic) or may show mild to severe symptoms in individuals. – specific individuals, especially individuals with low immunity conditions or have comorbidities. Symptoms of COVID-19 infection include fever, malaise, cough, shortness of breath and shortness of breath. This virus can cause Acute Respiratory Disease Syndrome (ARDS) to death in severe conditions.²

Pregnancy is a condition in which immune tolerance occurs, which causes a woman to become susceptible to viral infections.³ Pregnant women become very susceptible to respiratory pathogens and severe pneumonia due to immunosuppression and physiological adaptive changes during pregnancy, such as increasing the diaphragm, increased oxygen demand and oedema. respiratory tract mucosa can make pregnant women intolerant of hypoxic conditions.⁴ These conditions cause pregnant women to have a higher risk of contracting Covid-19 with more severe symptoms and even death. This high mortality and morbidity is a consequence for pregnant women and the fetus they are carrying. To date, evidence and data showing confirmed cases, transmission, incidence and effects of SARS-CoV-2 on pregnant women are still limited. Thus, pregnant women are considered more susceptible to infection than the general population.⁵ Gadjah Mada University Academic Hospital, since May 2020, has been appointed as one of the referral hospitals for Covid-19 patients in the Special Region of Yogyakarta. Characteristics, treatment and other information regarding Covid 19 are still being collected through various studies to improve the latest recommendations regarding diagnosis, treatment and follow-up of maternal Covid 19 patients. It is expected that data from patients Maternal Covid treated at our hospital can be processed into additional information for maternity and neonatal services for Covid 19 patients.

METHOD

The type of research used is descriptive research to make an objective picture of a situation. The application was used to analyze using SPSS version 25 (IBM, USA). The population in this study were all pregnant women with confirmed Covid-19 as evidenced by reactive PCR results and treated at the UGM Academic Hospital from September 2020 to December 2021. The study began after the issuance of a letter of eligibility for an ethical review by the Medical And Health Research Ethics Committee Faculty Of Medicine, Public Health And Nursing Gadjah Mada University (Ref. No: KE/FK/0921/EC/2021)

Research data was taken through electronic medical records at the hospital from July 1, 2021 to January 30, 2022. The respondents included were all pregnant women diagnosed with Covid-19, as evidenced by the results of a reactive RT-PCR examination and undergoing inpatient treatment at the UGM Academic Hospital. Patients were treated at the hospital until they finished treatment and delivery (Figure 1).

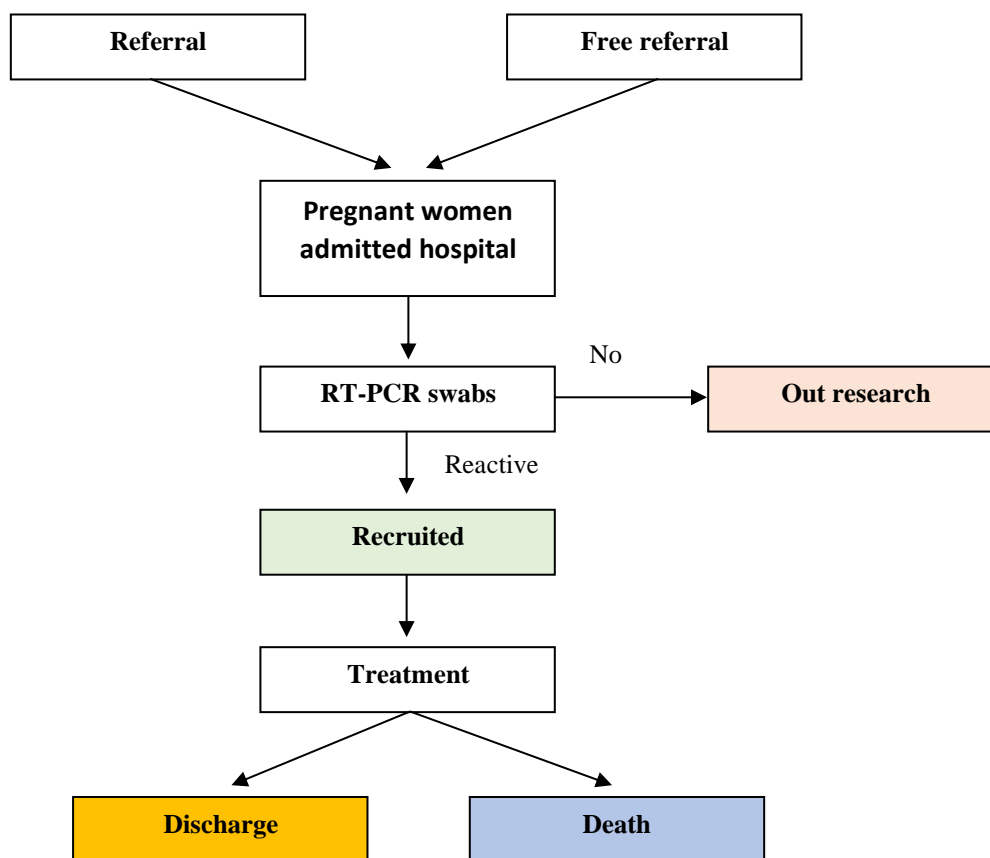


Figure 1. Algorithm of patient recruited as research sample

The exclusion criteria for this study were all pregnant women who suffered from co-infection or re-infection of Covid-19 and pregnant women who did not complete treatment or went home at the patient's request. The results of this study present a description of the characteristics and outcomes of pregnant women who suffer from Covid-19 (demographic data, hospital admission, complaints, gestational age at arrival for treatment, length of treatment, clinical classification and delivery method).

RESULTS AND DISCUSSION

1. Maternal background

This study showed that pregnant women suffering from Covid-19 had an age range ranging from 18 to 45 years with an average age of 30.2 years (Table 1). The incidence of COVID-19 in pregnant women is dominated by the third trimester of pregnancy. Most of them were referral patients, with 162 patients consisting of 139 patients referred from puskesmas, 1 patient each from clinical midwives and general clinics, seven from government hospitals, and 14 from private hospitals. The reasons for the referral were divided into three, namely 71 people who complained of Covid symptoms, 80 pregnancy complaints, and plans for isolation at the hospital as many as 59 people.

Table 1. Characteristics of pregnant women with Covid-19, September 9, 2020 – August 31, 2021

Outcomes	Maternal Data (n=210)
Clinical characteristic	
Ages (y) range (mean ± SD)	18 – 45 (30.2 ± 5.2)
Age group (y)	
15-24	24 (11.4%)
25-34	141 (67.1%)
35-49	45 (21.4%)
Trimester of pregnancy	
First	9 (4.3%)
Second	15 (7.1%)
Third	186 (88.6%)
Patients origin	
Free referral	48 (22.8%)
Referral	162 (77.2%)
Referral (n = 162)	
Midwifery clinic	1 (0.5%)
Outpatient clinics	1 (0.5%)
Public health center	139 (66.2%)
Public hospital	7 (3.3%)
Private hospital	14 (6.7%)
Reason hospital admission^a	
Covid complaint	71 (33.8%)
Pregnancy complaint	80 (38.1%)
Covid referral	59 (28.1%)

^a Complaints of covid: patients who come alone or are referred because they complain of covid-19; Pregnancy complaints: delivery plans, complaints related to pregnancy outside of covid; Covid referrals: asymptomatic or complaints have been resolved but require isolation rooms

2. Clinical Manifestation

During hospitalization, it was found that the main complaint was cough followed by fever, cold and anosmia (Figure 2).

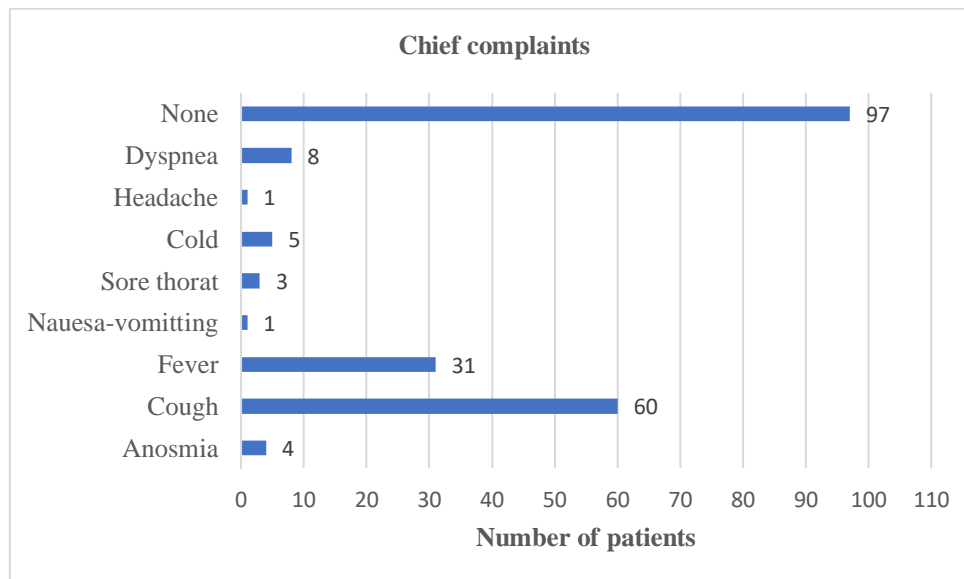


Figure 2. The main complaints of pregnant women with Covid-19 when they first came to the hospital, September 9, 2020 – August 31, 2021

In pregnant women with COVID-19, six people had a history of hypertension, followed by allergies, five people, asthma and obesity three people each (Figure 3).

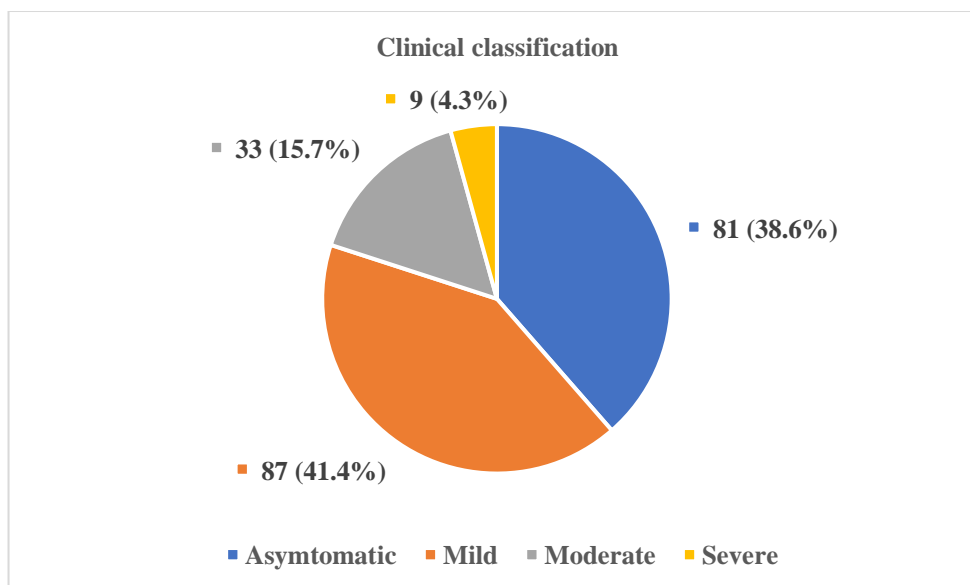


Figure 3. Clinical classification of pregnant women with Covid-19

Most pregnant female patients give birth at our hospital, but some do not because their gestational age is still immature or they give birth elsewhere. As many as 167 patients gave birth. The delivery method mainly was a cesarean section with 96 pregnant women, vaginally as many as 71 people and 43 people who did not give birth (Figure 4).

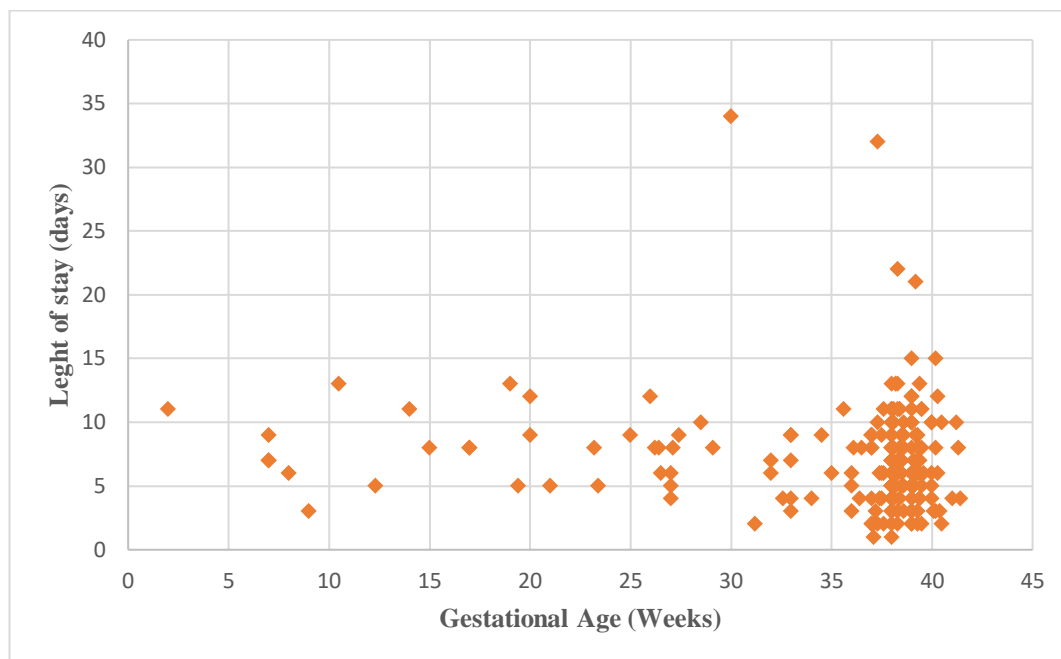


Figure 4. Scatter diagram between gestational age and length of stay

3. Pregancy Outcomes

In pregnant women with COVID-19, six people had a history of hypertension, followed by allergies five people, asthma, and obesity three people each. Most pregnant female patients give birth at our hospital, but some do not because their gestational age is still immature or they give birth elsewhere. As many as 167 patients gave birth, most common delivery method was a cesarean section. Pregnant women who gave birth in the hospital underwent a radiographic examination of the lungs with an x-ray. Overall, the patient had a normal radiographic appearance, most of the lesions with bronchopneumonia or pneumonia. Pulmonary CT-Scan examination was also performed in 34 patients, predominately having bronchopneumonia or pneumonia. The average length of stay for pregnant women in the hospital is seven days, with the shortest duration being one day and the longest being 34 days. A total of 5 people were treated in the ICU, and the most oxygen intervention was given with nasal cannula supplementation. Most antiviral treatment given was remdesivir followed by favipiravir. In addition, some were given IVIG or convalescent plasma therapy, although a few had severe symptoms. The group of pregnant women with Covid-19 treated had complications such as anemia, preeclampsia, premature rupture of membranes, gestational hypertension, placenta previa, gestational diabetes, to postpartum hemorrhage. Among the 210 cases, 7 cases died, and 203 were discharged from the hospital (Table 2).



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Table 2. Maternal and fetal outcomes with Covid-19

Comorbid	
Allergy	5 (2.3%)
Asthma	3 (1.4%)
Autoimmune	2 (0.9%)
Diabetes mellitus	1 (0.4%)
Gastritis	2 (0.9%)
Hypertension	6 (2.8%)
Hyperthyroidism	1 (0.4%)
Obesity	3 (1.4%)
Oligohidramnion	1 (0.9%)
None	186 (88.5%)
Mode of delivery (n = 167)^b	
Cesarean section	96 (57.4%)
Induction	40 (23.9%)
Spontaneous vaginal	28 (16.7%)
Extraction	3 (1.7%)
X-ray results (n = 167)^c	
Pleural effusions	1 (0.5%)
Infiltrate	12 (7.1%)
Nodule	1 (0.5%)
Bronchopneumonia/pneumonia	45 (26.9%)
Normal	108 (64.6%)
CT-Scan results (n = 34)^d	
Infiltrate	3 (8.8%)
Nodule	1 (2.9%)
Bronchopneumonia/pneumonia	22 (64.7%)
Normal	8 (23.5%)



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Hospital length of stay (days) range (mean ± SD)	1 – 34 (7.4 ± 4.1)
ICU admission	5 (2.4%)
Oxygen intervetion	
High flow nasal cannula	5 (2.4%)
Nasal cannula	28 (13.3%)
Non-rebreathing mask	4 (1.9%)
Invasive mechanical ventilation	4 (1.9%)
Without intervention	169 (80.5%)
Antibiotic treatment^e	
Azithromycin	90 (42.9%)
Levofloxacin	31 (14.8%)
Other treatments	
Remdesivir	48 (22.9%)
Favipiravir	11 (5.2%)
Hidroksikloroquin	2 (1%)
Oseltamivir	1 (0.5%)
Lopinavir	1 (0.5%)
Tocilizumab	1 (0.5%)
Intravenous Immunoglobulin	2 (1%)
Convalescent plasma	2 (1%)
Maternal morbidity	
Preeclampsia	13 (6.2%)
Prelabor rupture of membranes	12 (5.7%)
Postpartum haemorrhage	1 (0.5%)
Placenta previa	5 (2.4%)
Anaemia	20 (9.5%)
Gestational diabetes	4 (1.9%)
Pregnancy-induced hypertension	6 (2.9%)

Clinical outcomes	
Hospital discharge	203 (96.7%)
Death	7 (3.3%)
Fetal outcomes	
Stillbirth	1 (0.6%)
Preterm delivery <37 weeks	4 (2.4%)
Low birth weight	9 (5.4%)
Fetal birth weight (g) range (mean ± SD)	1550 – 4000 (3057 ± 396.9)
Fetal birth length (cm) range (mean)	42 – 60 (48)
Apgar score 1st minutes (mean) ^f	7 (7 – 8)
Apgar score 2nd minutes (mean) ^f	9 (9 – 9)
Length of stay (days) range (mean ± SD)	2 – 30 (7 ± 3.7)

^bPatients who give birth in the hospital

^cNumber of patients who underwent chest radiography during hospitalization

^dNumber of patients who underwent a chest CT scan during hospitalization

^eA total of 178 patients were given antibiotic treatment, but 121 patients were given antibiotics for treatment related to COVID-19 (Azithromycin and Levofloxacin). The rest were given antibiotics for prophylaxis or adjusted to other needs.

^fApgar score presented as median (Q1 -Q3)

4. Fetal Outcomes

One stillbirth fetus was found among 167 deliveries performed, then four fetuses were born prematurely before 37 weeks of gestation. Most of the fetuses were born with proportional body weight, but only nine fetuses had low birth weight (<2500 grams). The lowest birth weight range was 1550 grams, and the largest was 4000 grams with an average of 3057 grams. Fetal birth length ranged from 42 to 60 cm with an average of 48 grams. After delivery, fetal viability was checked by calculating the Apgar score at the first and fifth minutes. In the first minute, the average score was seven, and in the fifth minute, it was nine. The fetus that was born was then treated at the hospital. The average treatment time was seven days, with the fastest being two days and the longest treatment being 30 days.

Discussions

The data of this study were taken and processed using a cross-sectional descriptive method from the electronic medical records of the Gadjah Mada University Hospital Yogyakarta by taking a sample of 210 cases. Gestational age is mainly in the third trimester gestational age group. This follows Filho et al. which found that half of the pregnant women had a gestational age of more than 32 weeks.⁶ In a similar study conducted by Knight et al. in England, 427 samples found that the gestational age was dominated by over 32 weeks of gestation until term.⁵ Likewise, from the results of a systematic review conducted by Chi et al., it was found in the third trimester with 124 patients out of a total of 154 who delivered.⁷



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Most pregnant women suffer from mild symptoms of Covid-19 followed by asymptomatic conditions, moderate and severe symptoms. These results are similar to those obtained by Liu et al. with 15 pregnant women hospitalized in China. They found that all pregnant women had mild symptoms.⁸ In this study, most of them were asymptomatic (Figure 2). Cough and fever are the predominant symptoms in symptomatic patients. Other symptoms are shortness of breath (dyspnea), cold, anosmia, dizziness, nausea, and vomiting. The authors found that five studies showed that the main complaints of Covid-19 were the same as this study.^{3,6,8-12} These results were confirmed by a meta-analysis conducted by Allotey et al., involving 77 studies.¹³ Out of 210 patients, as many as seven died during treatment, and the rest were discharged from the hospital.

Delivery for pregnant women with Covid-19 is expected to reduce morbidity for these patients. There are no specific recommendations for childbirth that the Indonesian Obstetrics-Gynecology Association (POGI) must be carried out. However, if respiratory problems require immediate treatment, a cesarean section can be performed.¹⁴ This condition occurred especially at the beginning of the Covid-19 pandemic, but since 2021 POGI recommends the delivery method according to obstetric indications.

The picture of bronchopneumonia or pneumonia was primarily found in pregnant women treated at our hospital. This picture follows the study conducted by Yu et al. in 7 pregnant female patients with Covid-19, where six patients had bilateral pneumonia, and one patient had unilateral pneumonia.¹⁵ Apart from pneumonia lesions, other abnormal features, namely infiltrate were also found, although not many. Days of care while in hospital have a wide range. The average patient is treated for seven days. Shorter treatment days were obtained from a study conducted by Sahin et al. in Turkey involving 1416 cases. They received an average treatment day of 3 days ranging from 1 to 35 days.¹⁶ Compared with our study, the treatment days obtained were almost the same as those obtained by Sahin et al., which was 1 to 34 days. In another study, the median length of hospital stay was 14 days.¹⁷

Some pregnant women with Covid-19 need additional nasal cannula assistance to mechanical ventilation, especially in severe cases and intensive care. Furthermore, some patients received antibiotic treatment, especially azithromycin, following the Covid-19 handling protocol where symptomatic pregnant women receive antibiotic therapy. This drug is safe for consumption, especially in pregnant women and breastfeeding. The primary purpose of administering this drug is to prevent the risk of severe infection.¹² Antiviral treatment, especially using remdesivir, is said to shorten the duration of the severity of moderate and severe Covid-19 conditions.¹⁸ However, the efficacy and use of remdesivir in pregnant women still need to be studied further. This is in-depth because data on the safety of using remdesivir in humans, especially pregnant women, are limited.¹⁹

Concomitant conditions experienced by pregnant women with Covid-19 often found preeclampsia followed by premature rupture of membranes. Covid-19 infection was associated with high rates of preeclampsia in one meta-analysis.^[9] In addition, the incidence of premature rupture of membranes was also found to be higher in pregnant women with Covid-19 compared to healthy pregnant women.¹⁰

Stillbirths case in our study were very low, with only one case of stillbirth, then only four cases of preterm birth were found out of 167 births. In a study conducted by Akbar et al., the case of stillbirth was not higher in pregnant women with Covid-19 compared to the non-Covid-19



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patient group where their study was conducted at a referral hospital for Covid-19 patients.²⁰ Fetuses born had an average birth weight of 3057 grams with only 9 cases of low birth weight, with most fetuses born having a proportional weight. The case of low birth weight fetuses in pregnant women with Covid-19 is similar to the study conducted by Saimin et al.. In their research, among 41 deliveries carried out, only three cases (7.3%) of fetuses had low birth weight.²¹ Most of the fetuses born had normal Apgar scores in the first and fifth minutes. Compared with the study conducted by Selvi et al., they found that all fetuses were born with normal Apgar scores.²² Our research also presents the duration of stay fetuses with an average of 7 days.

CONCLUSION

Most pregnant women with Covid-19 are asymptomatic. Then other have mild symptoms although some have moderate to severe symptoms. The most common complaints are cough and fever. Further research is needed with a larger sample or with an in-depth analysis of various variables.

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CONFLICT OF INTEREST (if any)

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