

## COVID 19 AND PREGNANCY -OUR EXPERIENCES

Marija Cvetanovska,<sup>1</sup> Ilir Demiri<sup>1</sup>, <sup>1</sup>Krsto Grozdanovski, <sup>1</sup>Katerina Spasovska, <sup>2</sup>Ana Daneva Markova, <sup>1</sup>Stojanoska Tatjana, <sup>3</sup>Vlatko Cvetanovski

<sup>1</sup>University Clinic for Infectious Diseases and Febrile Conditions, Clinical Centre, Faculty of Medicine, Ss. Cyril and Methodius University in Skopje, R. North Macedonia, <sup>2</sup>University Clinic of Gynecology and Obstetrics, Clinical Centre, Faculty of Medicine, Ss. Cyril and Methodius University in Skopje, R. North Macedonia, <sup>3</sup>General Hospital Re-Medika, Skopje, Republic North Macedonia

### Abstract

A retrospective analysis was made on 35 patients: 25 pregnant women and 10 women in the early postpartum period with clinical and laboratory confirmed COVID 19. On admission demographic, clinical, lab parameters, comorbidities, complications and parameters correlated with the pregnancy and the mode of delivery were observed. Sars Cov 2 was confirmed in a nasopharyngeal swab with a molecular method of RT-PCR. The average age was 30.7 years old. 21(84%) were in their third trimester and 16 (45.7%) had comorbidities. The most common complication was pneumonia 31 (88.57%) and the most frequent symptoms were: fever 26 (74.2%), cough 25 (71.4%), malaise 19 (54.28%) and dyspnea 15 (42.85%). 20 (57.4%) patients displayed severe clinical condition with need of oxygen support and they were all treated in the intensive care unit. 3 (15% ) were placed on non-invasive ventilation, and 4 (20%) needed mechanical ventilation, all of them in the postpartum period. Mortality rate was 3 (8.57%) and it was registered only in the postpartum period.

Covid 19 in pregnancy and among the general population shares the same clinical manifestations. Pregnant women having pneumonia, more than one comorbidity, are in the third trimester of their pregnancy or in their postpartum period, were pointed out as having the highest risk of getting severe clinical condition and a poor outcome. In the light of the above, these are the patients in need of intensive observation and monitoring, as well as necessary, strict anti-epidemic measures and prioritized vaccination.

**Key words:** Covid 19, pregnancy

### Introduction

COVID 19 is an illness which is caused by SARS Cov 2 virus, a new, global pandemic challenge that humanity has been facing for the last two years. The world statistics display astonishing figures, a total number of 250 million infected people and over 5 million deaths, and over 200 000 infected cases and more than 7000 reported death cases in our country, specifically (November 2021). The SARS Cov 2 virus belongs to the group of RNA viruses and is characterized by a high index of contagiousness. In the human organism the infection affects all organic systems with a dominant expression to the respiratory system [1,2,3].

A typical clinical manifestation of Covid 19 includes high temperature, dry cough, sore throat, malaise, loss of the sense of smell, shortness of breath and respiratory weakness [4,5,6].

The clinical presentation varies from light, asymptomatic forms, through medium manifested clinical presentation, to severe clinical manifestations with a rather high mortality rate. The risk factors for developing a severe clinical form of Covid 19, are older age, presence of comorbidities, diabetes mellitus and cardiovascular illnesses, as well as certain immune-compromising conditions [7,8,9].

Many studies analyze the effects of Covid 19 on the general population, but the number of analyzed data among the vulnerable population such as pregnant women is insufficient. Researches during previous pandemics pointed out pregnant women to be a group at risk of respiratory viral infections, developing severe pneumonia and a poor outcome, due to the physiological changes of the immune and cardiopulmonary system during pregnancy [10-15].

The immune system of a pregnant woman faces a number of challenges during setting a balance with the fetus and maintaining microbiological stability. The hyperdynamic state of the mother herself,

supporting the presence of the fetus, manifests with a number of circulatory changes which make the mother's and the child's organisms to be significantly more vulnerable. The respiratory system of the mother is also stressgenic transformed due to the significantly increased intra-abdominal pressure from the fetus, a condition that causes lifting of the diaphragm itself and lowering of the lungs capacity. Furthermore, connected to this are conditions of increased oxygen release, mucosal edema of the respiratory tract which leads to a decreased hypoxia tolerance [16,17].

All of the above mentioned conditions lead to a vulnerable condition of the mother towards the virus infections, especially those that primarily attack the respiratory system, such as SARS Cov 2. Numerous studies have stated the above mentioned discussions although there are some published studies that do not point out pregnancy as a risky condition [18- 20].

The **aim** of this study is to present our experiences on a certain vulnerable group of patients connected to the current pandemic situation with Covid 19.

### **Materials and methods**

The study was retrospective, clinical and carried out on the University Clinic for infectious diseases and febrile conditions starting from March 2020 to October 2021. 35 patients were analyzed: 25 pregnant women and 10 women in the early postpartum period with clinically and laboratory confirmed COVID 19.

On admission to hospital the following characteristics were observed: demographic features, clinical symptoms and signs, laboratory-biochemical parameters, present comorbidities and complications.

There were special parameters connected to the pregnancy of the patients, such as gestational week of the pregnancy, the mode of delivering, as well as the gestational week when giving birth and presence of obstetric and gynecological diseases.

The presence of the SARS Cov virus was confirmed with a nasopharyngeal swab specimen taken during the examination of the infected patients using a qualitative molecular method RT-PCR (reverse transcriptase – polymerase chain reaction in real time).

The data was statistically processed in the SPSS program for Windows 13,0, with comparative statistical methods. The value of  $p < 0,05$  was taken of significant, and the value of  $p < 0,01$  highly significant.

### **Results**

The study analyses 35 patients, 25 pregnant women out of who two gave birth during the treatment and 10 women in the early postpartum period who were transferred from The University Clinic of gynecology and obstetrics, immediately after delivering due to confirmed Covid 19.

The average age of the analyzed group was 30.7 (range 22-39 years old), 29 (82.8%) patients were from an urban environment, and the rest 6 (17.1%) came from a rural area. All of them confirmed to have had a regularly controlled pregnancy, smoking as a risk factor was found among only 2 (5.71), and only 4 (11.42) reported to have had one or more abortions. 11 (31,4%) had obstetric diseases, and 6 (17.1%) had gynecological diseases, mostly endometriosis and pre-eclampsia, and one patient reported having a cyst on the choroid plexus. 15 (42.8) of the patients were treated with some kind of medication during their pregnancy, most frequently anticoagulant therapy 11 (31.4%) and antibiotics 10 (28.5). 10 (28.5%) gave birth for the first time, the same number were mothers who gave birth for the second time, and 5 (14.2%) gave birth for the third time. The rest 28.8% had given birth multiple times.

The highest percentage 27 (77.1%) had a gestational age of pregnancy under 37 weeks, average 27.6 (range 3-40) gestational weeks. 16 (45.7%) of the patients had comorbidities, with 4 (25%) having hypothyroidism, 4 (25%) having anemia, 3 (18.7%) had hypertension, 2 (12.5) had thrombocytopenia, one had diabetes mellitus, one was with asthma, and one had thrombophlebitis.

Two of the patients had two comorbidities, and one had three comorbidities and they all expressed severe clinical condition and needed oxygen support. Most of the pregnant women 21(84%) were in the third trimester of their pregnancy. The most common complication was pneumonia which was clinically and x-ray confirmed at 31(88.57%) of the patients. In terms of complications, 2(6.25%) patients

had sepsis as a postpartum complication, one patient got pulmonary thromboembolism, and one got myocarditis. All the patients had the Sars Cov 2 virus confirmed by the molecular method of RT-PCR (reverse transcriptase–polymerase chain reaction in real time) with nasopharyngeal swab specimen technique. Table 1 presents the general characteristics of the examinees.

**Table 1.** General characteristics of the examinees

Variable	Number (%)
Age mean (years)	30.7 (range 22-39)
Age interval (years)	
22-25	(5.7)
26-30	(37.1)
31-35	(45.7)
36-40	(11.4)
Pregnancy number	
1	10 (28.5)
2	10 (28.5)
3	5 (14.2)
> 3	10(28.5)
Period at diagnosis	
Antenatal	25 (71.4)
Postnatal	10 (28.5)
Gestational age (weeks)	
Mean	27.6
Range	(3-40)
Trimester of pregnancy (at diagnosis)	
first	4(11.4)
second	7(20)
third	24(68.5)

The most common symptoms that the clinical condition manifested with were fever 26(74.2%) and a cough 25(71.4%). 15(42.85) had dyspnea, and 19(54.28%) had malaise. Less common symptoms were chest pain 8(22.8%), sore throat 10(28.57) and nasal secretion 5(14.28%). The clinical manifestations of the patients are presented in Table 2.

**Table 2.** Clinical manifestations of the patients.

Variable	Number (%)
Fever > 37.8	26 (74.2)
Cough	25(71.4),
Dyspnea	15(42.85)
Malaise	19(54.28)
Sore throat	10(28,57)
Chest pain	8(22.8)
Nasal secretion	5(14.28)

Table 3 presents the examined laboratory-biochemical parameters which statistically had significantly increased values on admission.

**Table 3.** Laboratory-biochemical parameters of the patients

Variable	mean value min-max	P value
NLR (neutrophile/lymphocyte ratio)	8.5 (0,6-48)	<0,01
C-reactive protein mg/l	87.11 (5-268)	<0,01
Lactate dehydrogenase IU/ml	386.77(122-2466)	<0,01
Di dimmers ng/ml	3531.8 (409-35712)	<0,01

20 (57,4%) of the patients presented a severe clinical condition with a need of oxygen support and they were all treated at the intensive care unit.

Three of them or 15% were given non-invasive ventilation, and 4 (20%) were in the need of mechanical ventilation. Those were the patients from the group of women in postpartum period who were intubated during delivery due to the mode of giving birth as well as the severity of the clinical condition. All of the patients were delivered with a cesarean section.

The mortality rate in our examined group was 3(8.57%) and it was registered only in the postpartum period. Table 4.

**Table 4.** Maternal treatment outcome

Variable	Number (%)
Used oxygen	20 (57.4)
ICU admission	15 (42.85)
Non-invasive ventilation (NIV)	3 (15)
Mechanical ventilation (MV)	4 (20)
Pregnant women	23 (65.71)
Women in postpartum period	12 (34.28)
Maternal death	3 (8.57)
Mode of delivery	
Vaginal delivery	0
Cesarean section delivery	12

## Discussion

35 patients were processed in our study: 25 pregnant women, two of whom were delivered during the treatment, and one of them was with lethal outcome in the postpartum period due to a development of respiratory insufficiency and 10 women in their postpartum period who were transferred from the University Clinic of Gynecology and Obstetrics to our Clinic after delivering and two of them were with lethal outcome. Both of them were prematurely delivered with an urgent cesarean section due to the severity of their clinical condition and the development of a severe respiratory insufficiency and a condition of sepsis, and one of them was verified to have myocarditis as well.

The rest of the patients of the examined group recovered. The mortality rate in our group was 3 (8.57%) and it is within the limits of the referred mortality rate in the world for this vulnerable group [12,15,17,20].

Most of the patients 24 (68.5%) were in the third trimester of their pregnancy and it was them who presented a severe clinical condition, which points the third trimester out to be the period with the

highest risk of developing severe clinical condition and a poor outcome. Similar data have been presented by world studies as well, which is explained with the mother's myocardium being under pressure due to the hyperkinetic and hyperdynamic condition.

The hyperkinetic condition is a result of a condition of hyperkinetic stress of the myocardium in the mother due to expansion of the circulatory net of the fetus. On the other hand, the hyperdynamic condition pressures the mother's organism due to the compressive effects of the fetus through the diaphragm of the respiratory system and all the blood vessels in the abdomen due to increased intra-abdominal pressure. Taking these two confirmed forms into account, what is especially important is the size of the fetus and the more severe outcome of the more advanced forms of pregnancy where the compressive effects are emphasized [11,19].

The most common complication in our examined group was pneumonia, present at 31 patients (88.57%) with all of them having severe clinical condition and a need of respiratory support [10].

16 (45.7%) of the patients had comorbidities, with 4(25%) of them having hypothyroidism, 4(25%) had anemia, 3(18.7%) had hypertension, 2(12.5) had thrombocytopenia, one of them had diabetes mellitus, one had asthma and one had thrombophlebitis. 3(8.57%) of the patients had more than one comorbidity, with two of them having two comorbidities and one having three. All of them had a severe clinical condition and a need of oxygen support, but none of them was with lethal outcome. This data corresponds to data from the literature that show correlation of the number of comorbidities with the severity of the clinical condition and the outcome [21,22].

Our study was limited in terms of making a conclusion due to the small number of examinees and having no comparative analysis with the healthy population of pregnant women.

The most commonly displayed symptoms of our examined patients were: fever 26(74.2%), cough 25(71.4%), malaise 19 (54.28%) and dyspnea 15 (42.85%), which are also the most commonly manifested symptoms of the general population infected with Covid 19 and which are presented by other relevant studies [23-25].

There is no symptom which is pointed out as a dominant one in Covid 19 during pregnancy of this vulnerable group.

In terms of the examined lab-biochemical parameters that were significantly increased during examination, the following ones were pointed out: neutrophile-lymphocyte ratio, C-reactive protein, lactatedehydrogenase and D-dimers. A lot of relevant world studies select these parameters as prognostic factors which point to a severe clinical condition and a poor outcome at the time of the hospitalization itself [26,27].

### **Conclusion**

The clinical presentation of Covid 19 during pregnancy does not differ from the one of the rest of the infected patients in the general population. Considering the fact that pneumonia was the most common complication, we conclude that special attention must be paid to intensive observation of the respiratory function, the oxygenation and supporting respiratory function in the early phase of the disease.

Pregnant women who have more than one comorbidity, especially those who are in the third trimester of their pregnancy and those who are in the postpartum period should be observed, because of the risk of developing severe clinical condition and poor outcome. For this vulnerable group of patients, the anti-epidemic measures should be on a very high level together with strict supervision and prioritized vaccination.

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