



## Pathomorphological Changes and Clinical Aspects in Women with Covid-19 Infection In Khorezm Region

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Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 24 Nov 2023	<i>The COVID-19 pandemic, which began in 2019, remains one of the most dangerous infections that have had an impact to this day, but the dynamics of the disease has improved. This is due to the increase in the skills of doctors to fight this infection and the emergence of new and relatively mild strains of the disease.</i>
<b>CC License</b> CC-BY-NC-SA 4.0	<b>Keywords:</b> <i>Newborns, Coronavirus Infection, COVID-19, Pandemic, Prevention.</i>

### 1. Introduction

Morphological changes in severe acute respiratory distress syndrome caused by COVID-19 depend on the stage of the disease [6].

Specific pathomorphological macroscopic signs were not identified in COVID-19. Symptoms of severe respiratory failure and the appearance of acute respiratory distress ("shock lung" or diffuse alveolar damage) are observed. The acute and diffuse hemorrhagic syndrome occurs with swine flu. The volume and density of the lungs increase, there is little or no air, the appearance of varnish on the surface, and dark red (cherry) colors, when pressed, a dark red liquid flows from the cut surfaces, which is difficult to squeeze out of the lung tissue. Hemorrhagic infarction and thromboses are visible in the area of pulmonary veins. There is no visible damage to the trachea, serous-purulent exudate and intubated patients have hyperemia of the mucous membrane associated with sinozocomial infection.

Undoubtedly, damage to the microcirculation plays an important role in the pathogenesis of COVID-19. In this case, hemorrhages in the bronchus, in the branchial cavity, and interalveolar hemorrhages are characteristic and are complicated by spitting up blood. Later, these changes cause hemorrhoidal infarcts in tissues. Pulmonary vein thrombus should be differentiated from pulmonary artery thromboembolism, as Thromboembolism of the pulmonary artery (TELA) is one of the hallmarks of COVID-19.

**Purpose to study:** complications observed in children born to women with COVID-19 infection in Khorezm region during 2019-2021.

According to global statistics, 19% of hospitalized patients with COVID-19 have symptoms of heart damage (chest pain, hypotension, arrhythmia, symptoms of heart failure). Sinus tachycardia is detected in 16-72% of patients with COVID-19, in addition, bradyarrhythmia, acute coronary syndrome (with increased troponin levels and characteristic changes in the electrocardiogram) and sudden cardiac death have been observed [1,2,3]. It is worth mentioning that patients with severe COVID-19 will die from heart and pulmonary heart failure.

Kidneys are one of the main target organs of COVID-19. Because of the abundance of angiotensin-converting enzyme (ACE-2) in kidney podocyte, mesangial cells, and parietal epithelium of Bowman's capsule.

### Histological Appearance Of The Placenta Of Mothers Infected With SARS-CoV-2

In the first trimester of pregnancy, a high level of ACE 2 protein was noted in the placenta, which was localized in the syncytiotrophoblast, decidual cells (especially in the perivascular zones), and the stroma of the villi. ACE 2 promotes the release of angiotensin 1-7, which leads to positive vasodilation in the maternal-fetal system, but at the same time promotes the spread of SARS-CoV-2 [10]. Thus, based on the morphological appearance, it can be said that the risk of fetal infection at the beginning of pregnancy

is very low, but at the same time, an increase in the concentration of ASE2 in SARSCoV-2 can lead to a miscarriage. In an animal experiment, the expression of ASE-2 mRNA in the ovary was determined using PTsR in real-time. However, there are no reliable data on the possible effects of SARSCoV-2 on gametogenesis, oocyte quality, embryo development, and subsequent pregnancy. In the European Society of Human Reproduction and Embryology, oocytes and embryos lack receptors for SARSCoV-2, as well as zona pellu third, preovulatory follicles, and morula oocytes with high protection [8].

## **2. Materials And Methods**

During 2020-2021, the condition of babies born to women with a positive COVID-19 PTsR test during childbirth in Khorezm region, the complications observed in them, and the tactics of carrying babies were studied.

Tropism of SARSCoV-2 infections in the mammary gland. A relatively high level of TMPRSS-2 and ASE-2 mRNA expression was observed in the mammary gland, which does not exclude it as a target organ of the virus.

Immunohistochemical studies have shown the presence of SARS-CoV-2 N-protein [2] in perivascular trophoblasts and vascular endothelium [7].

In this regard, when analyzing the results of the morphological study of placentas of patients with SARS-CoV-2, the number of studied placentas ranged from 15 to 51 [7].

### **Histological Examination Of The Fetus**

Perivascular and pericellular swelling in the brain, erythrocyte stasis events in the vessels of the microcirculatory channel were recorded.

In the lungs, primary atelectasis events, alveolar tract damage, desquamated cells of the epithelium in the bronchioles are observed, and a large number of leukocytes are detected. RNA of SARS-CoV-2 coronavirus was found in the left lung during virological examination of lung autopsy material using PSR.

In the heart, ischemic twitching of muscle fibers, cardiomyocyte disintegration, erythrocyte stasis in vessels, small focal perivascular hemorrhages in microcirculation were noted.

In the liver, there are changes such as the expansion of central vessels and capillaries, stasis of mature red blood cells, signs of endothelial damage, and focal hemorrhages. Moderately clear dystrophic changes are noted in hepatocytes. Morphological changes detected in the lungs, fetal liver, and placenta, the presence of SARS-CoV-2 RNA in the placenta and fetal lungs, as well as information on the presence of the new Kovid-19 coronavirus infection in the mother were confirmed by the presence of viral RNA detected by the PTsR method, which indicates that the virus penetrates through the hematoplacental barrier. shows how to go. Taking into account that SARS-CoV-2 viral RNA was also found in amniotic fluid in severe forms of maternal COVID-19 [9], it can be assumed that SARS-CoV-2 is able to spread from the mother's body through the placenta to fetal organs and tissues, overcoming histo-hematic barriers. The tropism of this virus to endotheliocytes of heart, kidney, intestinal vessels, respiratory epitheliocytes (alveolocytes), cells of the immune system, intestinal epitheliocytes [10, 11], the presence of the virus in fetal tissues, especially in the lung, exposure of SARS-CoV-2 to the cells of lung tissue in the prenatal period of ontogenesis proves his ability.

Although the results of the study show the possibility of SARS-CoV-2 penetrating through the hematoplacental barrier, as well as signs of damage to the endothelium of the blood capillaries of the chorionic villi, liver and fetal lungs, the presence of focal diapedesis bleeding, the mechanisms of endothelial damage and other components of the histogematic barriers, pregnant further study of the frequency of fetal infection in women is required.

COVID-19 is an infectious disease and a major public health problem. More research is needed to identify factors that may mediate the pathogenesis of this severe and fatal disease. It should be noted that despite the clear progress made in the study of new coronavirus infection and the processes leading to the development of complications during pregnancy and childbirth, the problems of studying this pathology are many and require more detailed study.

## **3. Results and Discussion**

The scientific research was carried out in 2020-2021 at the Covid center of the TMA Urganch branch clinic, Maternity complex of the New Market and New Arik District Medical Association, Urganch.

The research was conducted in 2 stages:

Stage 1 - during 2019-2021, retrospective analysis of the birth history of pregnant women infected with COVID-19 and determination of the causes of death in the mother and child, which caused severe cases, comparing the conclusions of the pathologist with clinical cases.

Stage 2 - Prospective analysis of the course of the disease in 34 pregnant women diagnosed with COVID-19 treated in the hospital.

In the Khorezm region during 2020-2021, the analysis of women, live and stillborn babies diagnosed with Kovid revealed the following:

**Table №1** Information on women, live births and stillbirths diagnosed with covid in Khorezm region in 2020-2021

№	District and city name	Pregnant women diagnosed with covid 2020	Babies born alive in 2020	2020 stillborn babies	Pregnant women diagnosed with covid 2021	Babies born alive in 2021	2021 stillborn babies
1	<b>Yangiariq District Medical Association</b>	<b>452</b>	<b>97</b>	<b>10</b>			
2	<b>Yangibozor District Medical Association</b>				<b>319</b>	<b>17</b>	<b>8</b>
3	<b>TMA Urganch branch</b>				<b>469</b>	<b>91</b>	<b>4</b>
	<b>Total:</b>	<b>452</b>	<b>97</b>	<b>10</b>	<b>788</b>	<b>108</b>	<b>12</b>

In 2020, 452 pregnant women were registered in the obstetric complex of Yangariq District Medical Association. Of these, 97 (91%) of 107 women who were diagnosed with Covid-19 during childbirth returned home with a live baby in a satisfactory condition. 10 babies died, which is 9% of the total.

In 2021, 319 women were treated for Kovid 19 infection in the Yangibozor District Medical Association. During delivery, 25 women had a positive PSR test, of which 17 (68%) babies were alive and 8 (32%) died.

In 2021, 469 women were observed with Kovid-19 at the temporary Pregnant and Childbearing Women's COVID-19 Center near the Urganch branch hospital of the Tashkent Medical Academy, of which 95 women were in labor. 91 out of 95 women (96%) were discharged home with a healthy baby and 4 (4%) babies died.

In total, during 2020-2021, infection was detected in 227 women during childbirth, of which 205 babies were born alive and discharged home, which was 90%. Babies who were stillborn and died within 5 days after birth made up 10%.

It should be noted that the mortality rate decreased over time, but no significant difference was found between the morbidity indicators.

Acute asphyxia caused by immaturity was the main cause of death of infants in 64% of cases, and fetal distress was observed as a result of acute blood circulation disturbance between mother-placenta-fetus. The pathologoanatomical conclusions of the babies show that 100% of the children have full blood flow in the organs and cavities, cardiovascular insufficiency and DVS syndrome. 85% of infant deaths are caused by severe asphyxia caused by pulmonary atelectasis as a result of prematurity.

In 2020, 10 women and 8 women who died during pregnancy and childbirth were registered. We witnessed the condition of 5 of these women at the time of death, and the full clinical evaluation of the patients. In addition, we studied the medical history of 4 women. We could not find the medical history of the remaining women.

When we analyzed the medical history data of women who died due to Kovid-19 infection, it was found that the women applied to the hospital in a very serious condition and the disease developed quickly. The main cause of death was bilateral pneumonia outside the hospital. Shortness of breath 3 degrees. Pulmonary atelectasis. Lung tumor. was In most cases, DVS syndrome was observed in women, and bleeding was the main cause of death.

Approximately 1/3 of women infected with Covid 19 will develop diseases that worsen the perinatal prognosis of pregnancy. Covid-19, infected during pregnancy, leads to early development of placental insufficiency, which manifests itself from the beginning of the second trimester with uterine and fetoplacental blood flow disorders, Doppler ultrasound examination, the degree of maturity of the placenta and the period of pregnancy, ultrasound examination. Against the background of Covid-19,

we can distinguish the following most common complications of pregnancy: abortion, undeveloped pregnancy, isthmic-cervical insufficiency, placental insufficiency, intrauterine infection, premature rupture of the membranes, excess and insufficient hydration, premature birth, maternal and fetal death, chronic fetal hypoxia.

The age of the women in the study groups ranged from 19 to 35 years, with an average of 27 years.

According to this, pregnant women infected with Covid-19 are mainly workers and students, 33 (63.5%) of those in the retrospective analysis group were employees and 12 (23) were students, 7 (13.5%) housewives were affected in a relatively small percentage. Among the women of the prospective group, there were similar indicators, and it was 17 (50%), 9 (26.5%) and 8 (23.5%) people, respectively. Unlike these groups, women in the control group were mainly housewives, 8 (57.1%), employees and students, 4 (28.6%) and 2 (14.3%). It can be seen that those who communicate with many people are more likely to catch the disease.

When we observed the blood tests of women hospitalized with the diagnosis of Covid-19 according to the period of pregnancy before treatment, the level of blood coagulability increased as the period of pregnancy increased.

The blood of the patients admitted mainly in the 3rd trimester was evaluated as thick. The homeostasis of women diagnosed with Covid-19 has changed a lot compared to the control group, for example, fibrinogen in the 3rd trimester was 7.0, 6.3 and 4.5g/l, AChTV 17.1, 18.1 and 32.5sec, respectively, organized the It can be seen from this that in the 3rd trimester of pregnancy, blood is poured in a natural state, but when infected with Covid 19, the homeostasis accelerated.

In our study, after a retrospective analysis, women who were infected with Covid-19 and were discharged home in a satisfactory condition were observed for a prospective analysis. In this case, women were divided into 2 groups according to the period of infection, the first half of pregnancy up to 20 weeks, and the second half of pregnancy up to 40 weeks, after being treated in the hospital after being infected with Covid 19. Each group was further divided into separate subgroups according to the principle of treatment. Groups 1a- and 2a- continued antiaggregant and low molecular weight anticoagulant drugs under the control of coagulogram, in addition to the standard medical treatment during pregnancy, until the 33rd week of pregnancy. Women who came for treatment in the 1st trimester, depending on the changes in the coagulogram, took enoxaparin sodium 0.4 ml subcutaneously for 5 days and then drank Dipyridamol 25 mg 1 tablet 3 times for 15 days.

After passing through the 2nd trimester, women should take enoxaparin sodium 0.4ml subcutaneously for 7 days, then Dipyridamol 25mg 1 tablet 3 times for 30 days and non-stop acetylsalicylic acid 500mg divided into 4 quarters in the evening. They drank on their stomachs.

After the 3rd trimester, women underwent coagulogram analysis again. Enoxaparin sodium 0.4ml was taken subcutaneously for 7 days, then Dipyridamol 25mg 1 tablet 3 times for 30 days and non-stop acetylsalicylic acid 500mg divided into 4 quarters. in the evening they drank on an empty stomach. 33 weeks of pregnancy were calculated for women, and all drugs were stopped from this period.

An ultrasound examination was included in the examination plan. According to this, overhydration according to the amount of water in the tissues was observed only in groups 1-b and 2-b with 14.3, 16.7%, and dehydration was observed in practically the same amount in all groups 1(14.3%), 2(28.6%), 1 (8.3%) and 1 (7.1%) person. Symptoms of FPY in Ultrasound examination method (UTT) were higher mainly in 1b- and 2b groups in 2 (28.6%), 3 (25%) women, and in the second a-group in 1 (12.5%) woman. Fetal growth retardation syndrome was more common only in groups 1b and 2b compared to other groups, these indicators were 28.6% and 16.7%, respectively.

Taking into account the large number of obstetric complications that are observed when receiving patients, we became interested in assessing the state of the fetus. To evaluate the state of the fetus, the biophysical profile of the fetus was studied, this profile reflects the state of the fetoplacental complex.

Doppler examination was performed in 48 women (14 in groups 1a and b, 20 in groups 2a and b, 14 in group 3). According to the analysis of the obtained results, 1 (14.3%) woman in group 1a had 1 A level of uterine-placental-fetal blood circulation disorders, while in the comparison group, 7 women had uterine-placental-fetal blood circulation disorders, of which 1A level was 1(14.3%, 1B 1 (14.3%), 2A 2, 2B level 2. Perinatal loss occurred in a woman in the 2nd group with 2B degree of uterine-placental-fetal blood circulation disorder. It should be noted that complications were higher in the untreated group compared to the treated group.



When considering the obstetric anamnesis in this pregnancy, vomiting of pregnant women was more common in 1a-group 14.3%, and in 1b- group 42.9%, this complication was observed in 2 (14.3%) women in the control group. Premature rupture of the hymen was the most common condition, which was 14.3%, 42.9%, 25%, and 50% of the groups, and this condition was not observed in the control group. Gestational hypertension occurred in 14.3% of women in group 1a, in 28.6% of women in group 1b, this complication was not observed in the second group a, and in 33.3% of women in group 2b. This was not the case in the control group. In the untreated group, complications such as preeclampsia 3 (25%), perinatal loss 3 (25%), and bleeding during childbirth occurred in 3 (25%) women, which were not found in other groups.

#### 4. Conclusion

In women with Covid-19, various obstetric pathologies can occur as a result of blood circulation disorders between the fetus-placenta and the mother. However, it has been proven that this condition can be eliminated, that is, if a woman receives full treatment during pregnancy and is under the supervision of a doctor during the entire pregnancy, the likelihood of the above complications will decrease. This leads to a significant reduction in obstetric and perinatal losses.

**In general**, during 2020-2021, infection was detected in 227 women during childbirth, of which 205 babies were born alive (90%) and 10% of stillborn babies and babies who died within 5 days after delivery.

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