



Peculiarities of the Neurological Status of Pregnant Women and Parents Infected with Covid-19 During Different Times of Gestation

1. SH. I. Nasritdinova

2. D. K. Xaydarova

Received 29th Sep 2021,

Accepted 27th Oct 2021,

Online 29th Nov 2021

¹ Assistant of the Department of Obstetrics and Gynecology N1 Bukhara State Medical Institute.

² Associate Professor of Neurology, Tashkent Medical Academy, Doctor of Medical Sciences.

Abstract: To date, there are limited data on clinical manifestations and perinatal outcomes following infection with COVID-19 during pregnancy or the postpartum period. There is no evidence that pregnant women have different signs and / or symptoms or are at higher risk of serious illness. There is still no evidence of mother-to-child transmission when infection develops in the third trimester, based on negative samples from amniotic fluid, cord blood, vaginal discharge, throat swabs of newborns, or breast milk.

Keywords: COVID-19, perinatal, coronavirus infection, humoral influences, pathological course of pregnancy.

In our country, comprehensive large-scale programs are being implemented for early detection, high-quality diagnosis and treatment of neurological diseases, in particular, one of the main tasks of modern healthcare is "... to carry out comprehensive measures to radically improve the quality and expand the range of high-tech specialized care for patients with diseases of the nervous system." The decree assumes the active introduction of the achievements of modern research activities in all areas of medicine into the system of specialized medical care. Currently, the world has accumulated information about the manifestations of the infectious process in pregnant women when infected with SARS (Severe acute respiratory syndrome) -CoV-2 (Severe Acute Respiratory Syndrome, Coronavirus-2) - the new pandemic coronavirus causing COVID-19. However, to this day, recommendations for the management of pregnant women with COVID-19, affecting the nervous systems, have a low level of evidence. The study of neurological and depressive disorders and their association with COVID-19 in pregnant women is an urgent problem in obstetrics and neurology. The relevance and need to study these problems is completely obvious, since the study of the pathogenetic mechanisms of the development of neurological and depressive disorders during pregnancy and in the postpartum period will make it possible to find out the effect of COVID-19 on the course of pregnancy and the postpartum period. Therefore, a technique is needed to study neurological disorders in the postpartum period in women who have undergone coronavirus infection.

This dissertation work, to a certain extent, serves to solve the problems provided for in the decrees of the President of the Republic of Uzbekistan No. PP-4947 dated February 7, 2017 "On the strategy of

actions for the further development of the Republic of Uzbekistan", No. 3071 dated June 20, 2017 "On measures for the further development of specialized medical care to the population of the Republic of Uzbekistan for 2017-2021 ", as well as in other regulatory documents adopted in this area.

The question of the reasons for the increase in the activity of the sympathetic division of the ANS during pregnancy has not yet been studied. A number of authors believe that the increase in activity occurs under the influence of chronic stress, which is considered pregnancy [1]. Others regard this as compensation in response to systemic vasodilation, which occurs under the influence of nitric oxide, the production of which will increase significantly during pregnancy [2]. From the point of view of S.V. Khlybova and V.I. Tsirkin, an increase in the activity of the sympathetic division of the ANS during pregnancy is the result of a true increase in the activity of higher sympathetic centers under the influence of changes in the production of various hormones during pregnancy, and is also a consequence of an increase in the effectiveness of b-adrenergic effects on the heart (or a decrease in the effectiveness of M-cholinergic effects) [3].

It is most likely that, in general, an increase in sympathetic activity is a manifestation of adaptation to pregnancy and is aimed at the formation of mechanisms that ensure the growth and development of the fetus, including inhibition of the contractile activity of the uterus, an increase in the pumping function of the heart and the gas transport function of the blood. However, in the study of H.K. Mohammad, it was found that during full-term pregnancy in women without clinical signs of preeclampsia, there is a balanced autonomic regulation with the preservation of parasympathetic influences, while in pregnant women with preeclampsia in the second half of pregnancy, the dominance of the neural channel of regulation over humoral and sympathetic influences is revealed. over parasympathetic [4]. According to the author, during physiological pregnancy, the balance of nervous and humoral influences, sympathetic and parasympathetic activity is maintained, the stress index does not change over time.

Some authors distinguish the following characteristics of the ANS in the pathological course of pregnancy: 1. increase or decrease in tone and reactivity of the sympathoadrenal link; 2. activation of the central mechanisms of control of sympathetic reactions; 3. reducing the influence of the parasympathetic department; 4. a decrease in pulmonary-cardiac, cardiovascular effects in combination with multidirectional changes in the humoral link; 5. Simultaneous decrease in the activity of both parasympathetic and sympathetic influences. These characteristics have been described by a number of researchers, who consider computer cardiointervalography with the study of indicators of variational pulsometry and spectral analysis to be the most informative method for studying the state of the ANS in the pathology of pregnancy [6].

The role of the ANS in preeclampsia is confirmed by the decrease in heart rate variability in women with preeclampsia compared with this indicator in healthy pregnant women, noted by many authors. This fact can be regarded as evidence of excessive activity of the sympathetic division of the ANS in this complication [7]. It has been shown that an increase in heart rate variability may precede the development of preeclampsia [5.].

Talalaenko Yu.A., Bagriy A.E., Danilova Yu.N. (2011) found that "... compared to the data of spectral analysis of heart rate variability of healthy pregnant women and pregnant women with gestational hypertensive disorders at 37–38 weeks of gestation at rest and during exercise tests, the latter showed higher values of sympathetic and more low level of parasympathetic activity "[7].

Similar results were obtained by L.V. Akker and H.K. Mohammad (2005), they found that "... the development and progression of preeclampsia is characterized by an increase in the tension of the higher vegetative centers, protective-adaptive reactions are characterized by the predominance of central influences over humoral and sympathetic over parasympathetic ones and are aggravated as the severity of preeclampsia increases [9]. A differentiated assessment of the state of adaptation

mechanisms depending on the severity of preeclampsia was given in his study by AG Smirnov [10]. So, in milder forms of unfavorable course of pregnancy, he revealed the activation of defense mechanisms of adaptation of the somogenic type. Complicated forms of an unfavorable course of pregnancy were characterized by a significant tension of the adaptive mechanisms of the brain, which is manifested by a high level of anxiety, hormonal, immune and metabolic disorders, as well as a low-amplitude type of electroencephalogram or the presence of a high-amplitude background α -rhythm. For severe forms of an unfavorable course of pregnancy, the limiting stress of the adaptive mechanisms of the brain was characteristic.

In the study of D.O. Niyazlieva, a significant increase in pregnancy complications was noted in women with somatoform dysfunction of the ANS (ADVS). At the same time, the author notes the dependence of complications on the type of autonomic dysfunction. Thus, with hypotonic type ADVNS, pregnancy was complicated mainly by vomiting of pregnant women, the threat of termination, edema of pregnant women, and with hypertensive type ADVNS - by the threat of termination of pregnancy and preeclampsia [11]. In addition, it was revealed that vascular dystonia in pregnant women is accompanied by the development of chronic fetal hypoxia. The author considers the cause of the pathology to be chronic placental insufficiency, which develops in women with autonomic dysfunction.

Purpose of the study: to improve the methods of diagnosis and treatment of postpartum complications in women in childbirth who undergo coronavirus infection, by studying the pathogenetic mechanisms of the development of neurological and depressive disorders.

Research methods: The study consisted of 2 stages; the first stage analyzed the data of 1477 women treated at the Bukhara Covid Center. The study was conducted between July 2020 and June 2021. All patients tested positive for COVID-19 virus nucleic acid from a throat swab, and among women with Covid positive were 114 pregnant women with different gestational ages. These pregnant women made up the main group for studying the course of pregnancy with a previous Covid infection. The age gradation ranged from 19 to 39 years (average age 27.9 ± 1.8 years). The gestational age ranged from 12 weeks to 37 weeks (the average gestational age was 29.5 ± 0.3 gestational weeks).

The second stage of the study included analysis of the postpartum period among 81 women with a history of Covid infection at various gestational periods. The study was carried out in the immediate postpartum period in women who gave birth in the Bukhara region of the Kagan maternity complex (COVID study group - 19) According to our research, the age of women in the study groups was from 18 to 39 years, the average age was 27.2 ± 0.58 respectively, which had no significant differences.

The dynamics of the examination was carried out in the early (in the maternity hospital and late postpartum periods (in the private clinic "Nasriddin Shams Med", director Nasriddinov I.Sh.).

Hormonal status and EEG studies among puerperas were studied 10 days after delivery.

We also recruited a control group of women who lived in the same geographic area and gave birth in the hospital at the same time period as the study group. The age gradation of women ranged from 19 to 36 years (average age - 26.1 ± 0.50).

Scientific research results. Given that asymptomatic transmission of COVID-19 may be possible in pregnant or recently pregnant women, all women with an epidemiological history of exposure should be monitored.

During the study period, the diagnosis of a new coronavirus infection was confirmed in 81 patients. The age of the pregnant women ranged from 18 to 40 years (Fig. 1).

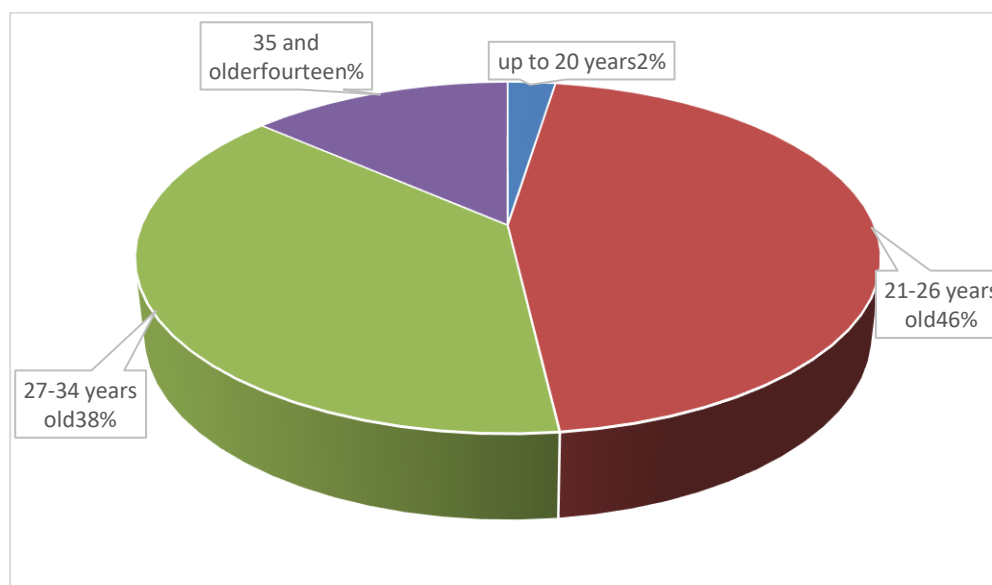


Fig. 1. Age gradation of pregnant women infected with covid infection

As can be seen from the data presented, among pregnant women infected with Covid infection, the peak incidence was at the age from 21 to 26 years (45.7%; 37 out of 81 pregnant women) and from 27 to 34 years (38.3%; 31 pregnant women out of 81). Among those infected with Covid, pregnant women over 35 years old were found in 13.6% (11 pregnant women out of 81), and under 20 years old, only 2.5% (2 pregnant women out of 81).

Among all pregnant women, infection in the first trimester (1-13 gestational weeks) of pregnancy occurred in 4.9% of cases (4 pregnant women out of 81), in the II trimester (14-27 gestational weeks) in 28.4% (23 pregnant women out of 81) and in 66.7% of cases in the III trimester (54 out of 81 pregnant women) (Fig. 2).

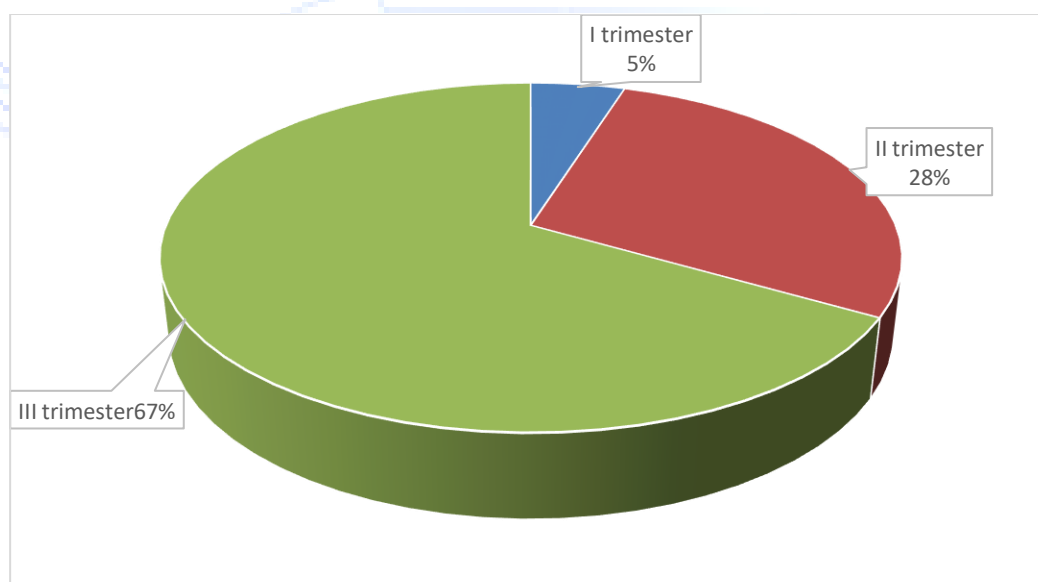


Fig. 2. Distribution of pregnant women infected with covid infection depending on gestational age

The most common somatic pathology (Table 3.1) is chronic arterial hypertension (32%), varicose veins of the lower extremities (16.0%), anemia (18.5%), varying degrees of severity from mild to severe (in 2 patients), thyroid disease (49%), overweight and obesity (66.7%).

Table 1: Prevalence of somatic pathology among infected pregnant women

	Main group (n=81)		Control group (n=80)	
	Abs.	%	Abs.	%
Arterial hypertension	26	32	0	0
Varicose veins	13	16,0	2	2,6*
anemia	28	34,6	38	47,5
thyroid disease	40	49,0	4	5,0*
overweight and obesity	12	14,8	1	1,3*

Note: * - reliability of data between groups ($P < 0.05-0.01$)

In a comparative analysis, we found that in pregnant women with covid infection, the somatic status was significantly significantly burdened in relation to the control group. The most common somatic pathology among pregnant women in the main group was thyroid disease. It should be noted that the presence of anemia in pregnant women, both in the main group and in the control group, was found in a large percentage.

Coronavirus infection manifested itself, as a rule, with nonspecific symptoms - an increase in body temperature in 70 pregnant women, with the exception of cases of asymptomatic course of the disease.

A cough, either dry or with a small amount of sputum in varying degrees of severity, was noted in 69 cases. Increased fatigue was noted by all patients, against the background of a normal pregnancy.

Complaints of nausea, vomiting, loose stools were quite rare - such a clinic was in 10 out of 81 pregnant women, while other symptoms - cough, fever were not excluded.

Dyspnea of varying severity accompanied the course of the disease in 36 patients - 6 of them had CT-3 volume of lung tissue damage and tachypnea upon admission to the hospital - 26 respiratory movements per minute. Saturation did not drop below 94%.

In the remaining 30, dyspnea was 22-26 respiratory movements per minute, saturation was at least 94%. All patients received oxygen inhalation through a mask.

Such a nonspecific symptom as loss of smell was observed in 51.9% of cases (42 out of 81 pregnant women), manifested itself by the third day from the onset of the disease and returned to normal on the 7-10th day of the disease, while other symptoms still persisted.

About 22% of pregnant women lost their sense of taste; the time intervals for loss and restoration of taste were the same as in the case of loss of smell.

In our observations, we were faced with 7 cases of asymptomatic course of the disease, these patients were verified by the diagnosis when identifying patients in families.

In 13 pregnant women, a mild course of the disease of the type of acute respiratory viral infection (ARVI) was established, all these women were admitted to the hospital with a full-term pregnancy with an already established diagnosis, none of them had a prolonged fever or persistent cough. Symptoms were limited to low-grade fever, loss of smell, sore throat. The severity of symptoms was limited to 5-7 days. There was no subfebrile temperature in any case for more than three days.

At a temperature that lasted from three to five days and the appearance of a cough, 23 pregnant women underwent CT scan of the chest - in all cases, bilateral polysegmental interstitial pneumonia was established, the volume of lung tissue lesions was CT-2.

In a comparative analysis of complications during pregnancy, we found that in the first half of pregnancy, toxicosis was observed in 65.4% of women in the main group, while in the control group it was 22.9% less frequent, but the data were not reliable (Table 3.2) ... ARVI in the first half of

pregnancy was observed only in 48.1% of pregnant women of the main group, as well as dermatoses of pregnant women, which were recorded in 35.8%. The threat of termination of pregnancy was noted in 66.7% of the main group, which is 2.2 times more often in relation to the control group and had a significant character ($P < 0.05$). Also, in the main group, diffuse goiter was significantly more often recorded, which was recorded in 19.7%, while in the control group only in 2.5% of pregnant women ($P < 0.01$).

Table 2: Comparative characteristics of the development of complications during a real pregnancy

	Main group (n=81)		Control group (n=80)	
	Abs.	%	Abs.	%
I - half				
Toxicosis	53	65,4	34	42,5
ARVI	39	48,1	0	0
Dermatosis of pregnant women	29	35,8	0	0
Interruption threat	54	66,7	24	30,0*
Diffuse goiter	16	19,7	2	2,5**
Anemia	76	93,8	54	67,5
II - half				
Diffuse goiter	41	50,6	4	5**
ARVI	40	49,4	0	0
Anemia	74	91,4	57	71,3
Preeclampsia	5	6,2	0	0
Bleeding	7	8,6	0	0
Premature birth	10	12,3	0	0
Prenatal effusion	24	29,6	0	0

Note: * - reliability of data between groups ($P < 0.05-0.01$)

Anemia in the 1st half of pregnancy was registered most often in the main group, the frequency of this pathology was 93.8%, while in the control group - 67.5%, which is 26.3% lower. However, the data were not reliable.

In the second half of pregnancy, there was an increase in the incidence of diffuse goiter both in the study group and in the control group. So in the main group, the incidence of diffuse goiter in the 2nd half of pregnancy increased by 30.9% (19.7% versus 50.6%; $P < 0.05$), a similar picture is observed in the control group (2.5% versus 5% ; $P < 0.05$). However, in the control group, diffuse goiter in the 2nd half of pregnancy was 10 times less common than in the main group ($P < 0.01$).

In the second half of pregnancy, 49.4% of women from the main group had ARVI, while in the control group none of the pregnant women had this disease.

Conclusion. Thus, this study makes an important contribution to understanding the impact of natural infectious disease on pregnant women. The results of the study also show that the quarantine and hospitalization measures taken in the COVID-19 zone had a strong psycho-emotional effect on women giving birth during this period, as evidenced by the increased ESRD and depression subscale scores in the immediate postpartum period. Concerns about the risk of contracting COVID-19, combined with quarantine measures, can exacerbate symptoms of depression and negatively affect the thoughts, emotions and functioning of women in labor.

REFERENCES

1. Breslin N. et al. Coronavirus disease 2019 infection among asymptomatic and symptomatic pregnant women: two weeks of confirmed presentations to an affiliated pair of New York City hospitals //American journal of obstetrics & gynecology MFM. – 2020. – Т. 2. – №. 2. – С. 100118.
2. NASRIDDINOVA, Shakhnoza I., et al. "Psychological Effects of Covid-19 Quarantine Measures on Mothers in the Positive Period." *Annals of the Romanian Society for Cell Biology* (2021): 1946-1951
3. Zimmermann, Petra, and Nigel Curtis. "Coronavirus infections in children including COVID-19: an overview of the epidemiology, clinical features, diagnosis, treatment and prevention options in children." *The Pediatric infectious disease journal* 39.5 (2020): 355.
4. Sanoev, Bakhtiyor. "Morphological and morphometric characteristics of the placenta in normal pregnancy." *InterConf* (2021).
5. Ниязлиева Д. О. Морфофункциональные особенности плацентарного комплекса у беременных с соматоформной дисфункцией вегетативной нервной системы : дис. – Российский университет дружбы народов, 2003.
6. Бабаджанова, Г. С., Дустова, Н. К., Ихтиярова, Г. А., & Аслонова, М. Ж. (2020). Клинические аспекты варикозной болезни у беременных женщин. In *Университетская наука: взгляд в будущее* (pp. 556-559).
7. Ихтиярова Г. А., Аслонова М. Ж., Дустова Н. К. Микробиологические изменения у беременных с антенатальной гибелью плода //Актуальные проблемы теоретической и клинической медицины. – 2019. – С. 33.
8. Khodjiev D. T., NK N. Z. H. K. D. K. K. Optimization of the diagnosis and treatment of early neurological complications in cardio embolic stroke //European Journal of Molecular & Clinical Medicine. – 2020. – Т. 7. – №. 07. – С. 2020.
9. Khodjiev D. T., Khaydarova D. K. Diagnosis and treatment of posttraumatic epilepsy //Journal of Research in Health Science. – Т. 1. – №. 2.
10. Abdurasulovich, Sanoev Bakhtiyor. "Morphological and morphometric characteristics of the placenta in normal pregnancy." *editor coordinator* (2021): 492.
11. Abdurasulovich S. B. et al. Age and metastatic characteristics of mammary cancer //ResearchJet Journal of Analysis and Inventions. – 2021. – Т. 2. – №. 09. – С. 18-21.
12. Djumayevich N. F. Macro-Microscopic Anatomy and Reactive Changes in the Testimonial Appendices under Exposure to Magnesium Chlorate in Postnatal Ontogenesis //International Journal of Innovative Analyses and Emerging Technology. – 2021. – Т. 1. – №. 6. – С. 152-155.