FEATURES OF INTERFERON STATUS IN NEWBORNS BORN TO MOTHERS INFECTED WITH COVID-19

Karomatova Fazolat Abdikahhorovna

Relevance: Numerous retrospective studies have been conducted to analyze the consequences of COVID-19 in pregnant women for their newborns [9]. It is known that vertical transmission of SARS-CoV-2 is possible, but appears to occur in a minority of maternal coronavirus infections during the third trimester [4,5]. Vertical transmission of the novel coronavirus infection (COVID-19) from mother to child is considered to be extremely unlikely [1]. Only a few, and rather controversial, cases of possible vertical transmission have been described in China [2,6] and Peru [3]. According to the current WHO guidelines, COVID-19 tests should be performed using reverse transcription polymerase chain reaction (RT-PCR) as the most accurate and reliable method for diagnosing viral infections [4].

Purpose of the study: To study the interferon status of newborns born to mothers infected with COVID-19.

Materials and methods: To investigate the interferon characteristics of newborns born to mothers with COVID-19, 60 newborns were examined at the Kagan "COVID Hospital" in Bukhara region. All pregnant women tested positive for SARS-CoV-2 via PCR. The examination was carried out between July and November 2021. All newborns were full-term with a gestational age of 38–42 weeks. IFNα, antibodies to IFNα, and IFNγ were measured in umbilical cord blood. The control group included 60 healthy newborns from mothers with physiologically normal pregnancies. Immunological studies of the newborns' blood were conducted at the Laboratory of Immunomorphology, Institute of Human Immunology and Genomics, Academy of Sciences of the Republic of Uzbekistan.

Study Results: Of the 60 newborns, 51 had an Apgar score of 7–8, while 9 had scores of 6–7. The results of interferon status analysis in the study group showed a statistically significant 4-fold decrease in IFNα levels in group 2 newborns compared to the healthy group — 33.32 ± 0.91 pg/mL ($p < 0.05$). The analysis of antibodies to IFNα also showed a significant increase in their levels — up to 156.54 ± 15.8 pg/mL in group 2 compared to 92.43 ± 7.58 pg/mL in group 1 ($p < 0.05$). These results indicate activation of antibody synthesis to IFNα in newborns exposed to maternal COVID-19 infection during pregnancy. Additionally, an increase in IFNγ levels was observed — 2.9 times higher in group 2 compared to the healthy group — 23.8 ± 0.6 pg/mL ($p < 0.05$).

Thus, the study of interferon status in newborns during the first five days of life shows a clear imbalance in interferon synthesis. On the background of a 2.9-fold increase in IFNγ and a 1.7-fold increase in anti-IFNα, a 4-fold decrease in IFNα synthesis was observed in full-term newborns born to mothers with COVID-19.

Conclusion: As a result of our research, it was established that a disruption in the interferon synthesis system occurs in newborns born to mothers infected with COVID-19.

REFERENCES

1. Capobianco G., Saderi L., Aliberti S., Mondoni M., Piana A., Dessole F., et al. COVID-19 in pregnant women: A systematic review and meta-analysis [published online ahead of print, 2020 Jul 16]. Eur J Obstet Gynecol Reprod Biol. 2020; S0301-2115(20)30446-2. doi:10.1016/j.ejogrb.2020.07.006
2. Coronavirus (COVID-19) Infection in Pregnancy. Version 12: RCOG, 14.10.2020. 77 p.
3. COVID-19 БИЛАН КАСАЛЛАНГАН ОНАЛАРДАН ТУҒИЛГАН ЧАКАЛОКЛАРНИНГ АҲВОЛИНИ БАҲОЛАШ Хамидова Феруза Каримовна Эргашева Юлдуз Султоновна Абу Али Ибн Сино номидаги Бухоро Давлат Тиббиёт институти https://doi.org/10.5281/zenodo.7625499
4. Diriba K, Awulachew E, Getu E. The effect of coronavirus infection (SARS-CoV-2, MERS-CoV, and SARS-CoV) during pregnancy and the possibility of vertical maternal-fetal transmission: a systematic review and meta-analysis. Eur J Med Res. 2020 Sep 4;25(1):39. doi: 10.1186/s40001-020- 00439-w. PMID: 32887660; PMCID: PMC7471638.
5. Jafari M, Pormohammad A., Sheikh Neshin S.A., Ghorbani S., Bose D., Alimohammadi S., Basirjafari S., Mohammadi M., Rasmussen-Ivey C., Razizadeh M.H., Nouri-Vaskeh M., Zarei M.. Clinical characteristics and outcomes of pregnant women with COVID-19 and comparison with control patients: A systematic review and meta-analysis. Rev Med Virol. 2021 Jan 2:e2208. doi: 10.1002/rmv.2208. Epub ahead of print. PMID: 33387448.
6. Karomatova Fazolat Abdikaxhorovna Characteristics and Immunological Status of Chronic Jaundice in Infants Born to Mothers Who Passed Covid-19 Vol. 2 No. 4 (2022) ISSN: 2795-921X38 https://www.innovatus.es/index.php/ejmmp
7. Schwartz DA. An Analysis of 38 Pregnant Women with COVID-19, Their Newborn Infants, and Maternal-Fetal Transmission of SARS-CoV-2: Maternal Coronavirus Infections and Pregnancy Outcomes [published online ahead of print, 2020 Mar 17]. Arch Pathol Lab Med.