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ACUTE PULMONARY HYPERTENSION IN COVID-19 POSITIVE INFANT WITH CONGENITAL HEART DEFECT (CASE PRESENTATION)

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SUMMARY

Background. Congenital infections in children often have a negative impact on the child's health, especially TORCH infections (toxoplasmosis, rubella, chlamydia, herpes). The impact of COVID-19 on TORCH syndrome is unclear.

The purpose of the study was to describe a case of COVID-19 infection in a newborn with TORCH syndrome.

Clinical case review. We describe a clinical case of an 8 weeks infant who admitted an intensive cure unit by emergency. He developed several episodes of apnea and tachyarrhythmia in hospital. Otherwise showed symptoms of pneumonia and probable respiratory distress. Further analysis revealed COVID-19 and active CMV infection. Instrumental tests showed inborn heart defect. Patient was consulted by cardiosurgeon.

Conclusions. Therefore, we assume COVID-related inborn heart defect, perinatal CMV hepatitis, pneumonia. This is not a rare case of COVID causing inborn heart defects that is usually seen in rubella and/or TORCH syndrome.

Key words: COVID-19, inborn hear defect, TORCH.

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РЕЗЮМЕ

ОСТРАЯ ЛЕГОЧНАЯ ГИПЕРТЕНЗИЯ У COVID-19-ПОЗИТИВНОГО МЛАДЕНЦА С ВРОЖДЕННЫМ ПОРОКОМ СЕРДЦА (КЛИНИЧЕСКИЙ СЛУЧАЙ)

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Актуальность. Врожденные инфекции у детей часто оказывают негативное влияние на здоровье ребенка, особенно TORCH-инфекции (токсоплазмоз, краснуха, хламидиоз, герпес). Влияние COVID-19 на синдром TORCH неясно.

Целью исследования было описание случая заражения COVID-19 у новорожденного с синдромом TORCH.

Результаты. Мы описываем случай 8 недельного ребенка, который был госпитализирован в отделение интенсивной терапии. Он развил несколько эпизодов апноэ и тахикардий в стационаре. В остальном отмечались признаки пневмонии и респираторного дистресса по вопросам. Дальнейшее исследование выявило COVID-19 и активную ЦМВ инфекцию. Инструментальное обследование показало врожденный порок сердца. Таким образом, мы делаем заключение о наличии врожденного дефекта сердца, перинатального ЦМВ гепатита, пневмонии. Ребенок консультирован кардиохирургом.

Выводы. Имеет место редкий случай, когда COVID вызывает пороки развития сердца, что обычно бывает при краснухе и/или TORCH синдроме.

Ключевые слова: COVID-19, врожденный порок сердца, TORCH.

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ТҰЖЫРЫМ

ТАУ БІТКЕН ЖҮРЕК АҚАУЫ БАР COVID-19-ПОЗИТИВТІ НӘРЕСТЕДЕ ЖЕДЕЛ ӨКПЕ ГИПЕРТЕНЗИЯСЫ (КЛИНИКАЛЫҚ ЖАҒДАЙ)

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Өзектілігі. Балалардағы туа біткен инфекциялар көбінесе баланың денсаулығына теріс әсер етеді, әсіресе TORCH инфекциялары (токсоплазмоз, қызамайық, хламидиоз, герпес). COVID-19-ның TORCH синдромына әсері анық емес.

Зерттеудің мақсаты. TORCH синдромы бар жаңа туған нәрестедегі COVID-19 инфекциясының жағдайын сипаттау болды.

Нәтижелері. Біз жедел түрде қарқынды емдеу бөліміне түскен 8 апталық нәрестенің клиникалық жағдайын сипаттаймыз. Ауруханада апноэ және тахикардияның бірнеше эпизодтары пайда болды. Басқа жағдайларда пневмония белгілері атап өтілді және респираторлық дистресс мәселесі назарға алынды. Артынан жүргізілген талдау COVID-19 және белсенді ЦМВ инфекциясының бар екендігін анықтады. Аспаптар негізінде жүргізілген зерттеу туа біткен жүрек ақауының бар екендігін көрсетті. Осылайша, біз туа біткен жүрек ақауы, перинатальды ЦМВ гепатиті, пневмонияның бар екендігі туралы қорытындыға келеміз. Балаға кардиохирург кеңесі берілді.

Қорытындылар. Біз COVID-тің жүрек ақауының дамуын туғызатын сирек жағдайға тап болдық. Бұл әдетте қызамайық және/немесе TORCH синдромында байқалады.

Негізгі сөздер: COVID-19, туа біткен жүрек ауруы, TORCH.

Дәйексөз үшін: Мұсағұлова Ж.Ш., Тримова Г.Ш., Ыдырысова Р.С. Туа біткен жүрек ақауы бар COVID-19 позитивті нәрестедегі жедел өкпе гипертензиясы (клиникалық жағдай) // Медицина (Алматы). 2024;3(239):24-27. doi: 10.31082/1728-452X-2024-239-3-24-27

PREFACE

COVID infection has various clinical signs and is often complications. The clinical picture has numerous clinical symptoms. It is considered to be a mild flu-like infection in children and severe multi-organ disease in adults. Less known about COVID in pregnant women, in term of its effect on mother's health as well as on baby's development. [Diagnosis and management of COVID-19 in pregnancy BMJ 2022;377:e069739]. The also problem is coincidence of TORCH syndrome in newborns from mothers with COVID infection in 1st, 2nd and 3rd trimester of pregnancy [1]. As well as existing vies that COVID-19: The Latest TORCH Infection [1, 2].

The aim of the report is to describe a case of COVID associated inborn heart and lungs disorder.

MATERIAL AND METHODS

We describe a clinical case, a patient admitted an infections hospital, where he received standard routine clinical, laboratory and instrumental examination. Received therapy according to the current clinical protocols.

RESULTS

A 8 weeks-old infant admitted hospital with jaundice, fever, difficulties of breathing and eating. A girl was born at the 40th week of gestation. Mother suffered from arterial hypertension and recurrent respiratory infections with fever during pregnancy. She denied drug and alcohol abuse. Child was hospitalized in severe condition, developed several apnea episodes and was sent to intensive cure unit where was intubated and set on ventilation. Patient had several episodes of paroxysmal tachyarrhythmia. Further investigation showed the following.

Blood gases pCO₂ 61 mm Hg, pH 7.19, pO₂ 228 mm Hg, Lactate 6.6 mmol/l, BE(B) 5.7 mmol/l, B_{eff} 4.9 mmol/l, HCO₃ 23.2 mmol/l, Hct 41%, SO₂c 37%, TCO₂ 25.2 mmol/l.

X-ray revealed signs of pulmonary hypertension, right side focal pneumonia. Heart margins shifted both sides due to enlargement of right and left ventricle.

Echocardiography left ventricle is enlarged, on the anterior leaf of mitral valve looking from the side of left atrium near head papillary muscles there are two hyperechogenic structures 1.2, 0.86 mm, and 1.3-1.0 mm.

ECG: P-Q=0.07 sec, QRS=0.1 sec, QRST (Q-T)=0.342 sec, QTc=0.342 sec, heart rate 123 per min, WPW, right posterior branch of His bundle, right atrium overload, right electrical axis deviation.

Blood counts: Hb 93 g/l, Hct 26.5%, WBC 12.9x10⁹/l, PLT 277x10⁹/l.

Biochemical analysis (ALT 200 N, AST 20 N, bilirubin 700 N).

Clotting time: 20.9 sec.; prothrombin time – 19.1 sec; prothrombin index – 53.7 %; MNO – 1.57; fibrinogen – 17.9 sec; fibronogen C – 1.46 g/L; activated partial thromboplastin time (aPTT) – 25.1 sec.

Ultrasound of abdomen showed hepatomegaly (lobus hepaticus dexter 7.2 cm, lobus hepaticus sinister 4.6 cm), enlargement of spleen (4.0 cmx2.1 cm, area 8.4 cm²).

Lab tests (ELISA) showed positive IgM, IgG to CMV. As well as positive COVID in blood in PCR.

According to what mother of the child was saying, a child is sick from the first days of life. She had difficulties to feed a child, she noticed episodes of fever. GP suggested acute COVID pneumonia. The infant had high fever, dyspnea, wheezing, was blueish. Blood counts showed leukocytosis and decline

of ESR. However, pediatrician took into consideration the information from mother that she found her child sick from the very first days of life. She described that she could not feed him, due to episodes of regurgitations. In the hospital a child developed acute apnea, it got blueish and collapsed. The intensive cure doctors started ventilation that helped. Further doctors suggested acute endocarditis, myocarditis, septic process. However, this did not fully correlate with apnea, yet, X-ray did show focal right sided pneumonia.

Roentgenologist described pneumatization of the lungs, enlargement of the vascular pedicle width, peribronchial cuffing and indistinctness of the pulmonary vessel walls. Right side focal pneumonia.

ECG showed overload of the right atrium with episodes of life threatening tachyarrhythmias. Cardiographical study showed defects of atrioventricular septum.

Consilium with cardio surgeons confirmed heart defects and recommended to do surgery once the inflammation and clotting status is normalized. Therefore, an infant received antibiotics, anticoagulants, transfusions of plasma and erythrocytes, intravenous immunoglobulins. As a result, the blood counts got better. Leucocytes dropped to normal, red cell rised, platelets, ESR levels went up. Clotting factors were supported by anticoagulant therapy and plasma infusions.

Neurologist found on MRI internal hydrocephalia. Periventricular leuco-encephalopathia with mild increase of CSF liquor pressure. Arachnoid cyst posterior cranial fossa. Large fontanel 2.0 cm×2.0 cm.

Ophthalmologist did not describe optic nerve edema, with mild vasculopathy.

The peculiarity of the case is that typical clinical picture of TORCH syndrome was seen in patient with COVID infection. Traditionally TORCH with heart defects is seen when rubella virus is found, in our case the congenital heart defects are seen in COVID patient. The question was about jaundice, that usually seen in TORCH syndrome. In this case we describe it in patient with CMV hepatitis with positive COVID tests. Rubella, chlamydia, herpes, syphilis, HIV were negative. The presented case has a lot of similarities with rubella induced TORCH, in our case rubella, as well as other typical casual infection were negative. According to literature data COVID-19 infection in children is favorable disease, but in pregnant causes still birth or spontaneous abortions. Less information is known about defects of ontogenesis. Another guess was if a mother was drug addicted, especially noticing the fact that a child had episodes (at least 3) of collapse, recurrent regurgitations, but the doctors did not find an evidence of that.

Otherwise, a case is complex, it shows complexity of inborn heart disease in infants is difficult, it requires understanding of mechanisms of arrhythmias in children, noticing signs of TORCH-like diseases, which include rash, fever, bluish color of the baby, impossibility it feed it, or provide fluids orally. Interestingly, we saw a patient with COVID-19 and arrhythmia, that might be due to other reasons, as medications, lack of mother care attention, or neglect. However in this casa a jaundice led our diagnostic menthal path to think about infections. Parallely the case was observed exactly at the peak of COVID-19 epidem-

ics, doctors immediately checked for COVID-19 virus, and the latter was detected as positive. We surprisingly defined another virus? It was CMV, who is a member of TORCH-group of syndromes.

DISCUSSION

Mohamed Ali Abdelkader et al., described a case of a 34-years-old non-vaccinated pregnant woman who had a COVID-19 infection in the first month of her pregnancy and went into premature labor at 34 weeks. Congenital heart disease and hydrops were present in the fetus. The infant girl was cyanotic after delivery, experienced bradycardia, and was in poor overall condition; she died 5 days later [3].

In our case the child was born on the 40th week of gestation, weight 3500 g, height 54 cm, we suggest a mother had whether 2 episodes of COVID or one episode between the 1 and 2 trimester. She could not prove it since was feeling seek within the whole pregnancy period.

Vaccination reduces risk of pregnancy complications in highly epidemic areas. It is applied in USA for pregnant but not approved in some other countries [4, 5].

Otherwise a child had typical clinical picture of congenital heart defect, an atrioventricular septal defect (AVSD), is a heart defect in which there are holes between the chambers of the right and left sides of the heart, and the valves that control the flow of blood between these chambers may not be formed correctly.

Congenital heart defects, or diseases, are problems with the heart's structure that are present at birth. They may change the normal flow of blood through the heart. Congenital heart defects are the most common type of birth defect, occurring in about one percent of live births in the United States.

There are many types of congenital heart defects. The most common defects involve the inside walls of the heart, the valves of the heart, or the large blood vessels that carry blood to and from the heart. Some defects are simple and require no treatment, while others are critical and require treatment soon after birth. In our case the condition of patient required a aid from cardiac surgeon, whom we addressed this issue.

Doctors often do not know why congenital heart defects occur, but several factors can raise the risk of having a baby born with a heart problem. Some risks include smoking or taking certain medicines during pregnancy, and a family history of congenital heart defects. Theoretically, an age of a female is crucial, but the age of her parental partner is less influential. In this case a mom was not that old, she had children before, without such problems.

Congenital heart defects can usually be found by a doctor based on symptoms or by newborn or prenatal screenings. Sometimes, a doctor may need to run heart tests to help diagnose you or your baby with a congenital heart defect.

Over the last several years, the diagnosis and treatment of congenital heart defects has improved. For example, there are better options for treatment, such as medicines and procedures. Now, many children and adults are living with or have recovered from congenital heart defects. Managing your condition by receiving routine follow-up care, taking

care of your mental health, and monitoring your condition can all help reduce complications and improve your quality of life.

The Centers for Disease Control and Prevention (CDC) estimates that about 2,118 babies (1 in 1,859 babies) are born with AVSD every year in the United States. AVSD is seen in X-linked trisomia. Other reason is rubella, as described by CDC [6].

CONCLUSION

We stress attention of GPs about benefits of immunization against COVID-19, in the USA they do vaccinated pregnant women. Mothers should be informed about COVID prophylaxis with immunization, that prevent COVID complications. Definitely routine screening for X-linked diseases

is also needed, especially in age risk groups or certain families with history of Down syndrome or sudden death of babies.

Transparency of the study

The study received no sponsor support. The authors are solely responsible for submitting the final version of the manuscript for publication.

Declaration of financial and other relationships

All authors participated in building the concept of the article and writing the manuscript. All authors have approved the final version of the manuscript. The authors received no honorarium for the article.

Conflict of interest

The authors declare no conflict of interest.

REFERENCES

1. Muldoon KM, Fowler KB, Pesch MH, Schleiss MR. SARS-CoV-2: Is it the newest spark in the TORCH? *J Clin Virol.* 2020 Jun;127:104372. doi: 10.1016/j.jcv.2020.104372. Epub 2020 Apr 14. PMID: 32335336; PMCID: PMC7195345
2. Sarin Pakhdikian. COVID-19: The Latest TORCH Infection. Peer reviewed, original research – non clinical trial. *NEONATOLOGY TODAY.* Volume 15 Issue 11 Pages 30-31. Release date: November 2020. DOI: <https://doi.org/10.51362/neonatology.today/20201115113031>
3. Abdelkader MA, Abbas HM, Aboelkhair IM, Alafify ASA, Elgazzar BA, Koura MSE. Congenital heart disease in a patient with COVID-19 infection during early pregnancy: a case report. *Egypt Heart J.* 2022 Aug 27;74(1):61. doi: 10.1186/s43044-022-00295-5. PMID: 36030341; PMCID: PMC9419912
4. Vincenzo Berghella. COVID-19: Overview of pregnancy issues. Available from: <https://www.uptodate.com/contents/covid-19-overview-of-pregnancy-issues>
5. Mai CT, Isenburg JL, Canfield MA, Meyer RE, Correa A, Alverson CJ, Lupo PJ, Riehle-Colarusso T, Cho SJ, Aggarwal D, Kirby RS; National Birth Defects Prevention Network. National population-based estimates for major birth defects, 2010-2014. *Birth Defects Res.* 2019 Nov 1;111(18):1420-1435. doi: 10.1002/bdr2.1589. Epub 2019 Oct 3. PMID: 31580536; PMCID: PMC7203968
6. Congenital Rubella Syndrome (CRS). Available from: <https://www.cdc.gov/ncbddd/birthdefects/surveillancemanual/chapters/chapter-5/chapter5-1.html>

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