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This is My COVID-19 History During Pregnancy and Breastfeeding Period: Maternal and Neonatal Outcomes

Gebelik ve Emzirme Dönemime Ait COVİD-19 Hikayem: Anne ve Yenidoğan Verileri

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ABSTRACT

The novel type coronoviruses cause the Coronovirus disease-19 as global health problem around the world since 2019. The number of pregnant women infected by new type of coronoviruses are on the rise.

COVID-19 infection in pregnancy ranges from asymptomatic infection to mild disease (no evidence of pneumonia or hypoxia) to moderate disease (viral pneumonia) until severe disease (severe pneumonia) and critical illness (acute respiratory distress syndrome, sepsis, septic shock, or complications such pulmonary embolism or acute coronary syndrome). But most pregnant women infected with SARS-CoV-2 are asymptomatic and most symptomatic women experience only mild or moderate cold/flu-like symptoms.

The effect of these viruses on the fetus, virus transmission from mother to baby and the protective role of antibodies are not clear yet. However, the majority of newborns were asymptomatic, tachypnea most likely secondary to transient tachypnea observed as the most common symptom.

Additionally, late complications after the Coronovirus disease-19 can be presented in some organs and/or systems like heart, brain, lung, gastrointestinal system.

Here described a case whose got Coronovirus disease-19 during third trimester of the pregnancy with transient and intermittant cardiac dysrhythmia after Coronovirus disease-19.

Key Words: Breastfeeding, Cardiac Dysrhythmia, COVID-19, Pregnancy

ÖZ

Yeni tip Koronovirus bağlı olan Koronovirus 19 hastalığı, 2019'dan beri tüm dünyanın sağlık problemi haline gelmiştir. Gebelik sürecinde de enfeksiyonun görülme sıklığı artmaktadır.

Gebelikte enfeksiyonun seyri asemptomatik, hafif bulgular (hipoksi ve pnömoni olmaksızın), viral pnömoni ve en nihayet ağır hastalık (akut solunumsal stres sendromu, sepsis, septik şok, pulmoner emboli veya akut koroner sendrom) şeklinde olmakla birlikte çoğunlukla asemptomatik bir seyir görülmektedir.

Enfekte anneden fetusa geçen virusun, fetusta nasıl bir etkiye yol açtığı ve antikorların koruyucu etkisi tam olarak netlik kazanmamıştır. Her ne kadar pek çok yenidoğan asemptomatik olsa da, yenidoğanın geçici takipnesi şeklinde bulgular görülebilmektedir.

Ek olarak, Koronovirus 19 hastalığının, kalp, beyin, akciğer, gastrointestinal sistem gibi bazı organ ve/veya sistemlere ait geç dönemde komplikasyonları da olabilmektedir.

Burada, gebeliğin son döneminde Koronovirus 19 hastalığı geçiren, sonrasında geçici ve aralıklı kardiyak disritmi bulguları olan bir vaka tartışılmıştır.

Anahtar Kelimeler: Emzirme, Kardiyak disritmi, COVİD-19, Gebelik

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INTRODUCTION

The novel type coronoviruses (SARS-COV-2) cause the Coronovirus disease-19 (COVID-19) as global health problem around the world since 2019 (1). The numbers of pregnant and breastfed women with COVID-19 are on the rise.

It has been suggested that the overall risk of vertical transmission and clinical symptoms in newborns of women with COVID-19 is small, although risks of neonatal complications are higher compared to infants of non-infected mothers (2,3). It is expected that infection by the SARS-CoV2 virus during pregnancy may increase the risk of maternal and fetal health complications and evolve to severe pneumonia, causing admissions to intensive care units (4).

Here, reported a COVID-19 experience during pregnancy and lactation period, without fetal complication and with possible late maternal complication.

CASE REPORT

A 42 years old healty woman had sore throat, malaise and severe myalgia in week 34 of pregnancy. Then she lived anosmia and ageusia. After five days she felt better, but anosmia and ageusia has continued three weeks. The patient had no other known health problems. One month later detection of the presence of anti-SARS-CoV-2 immunglobulin G (IgG) and immunglobulin A (IgA) in the serum were performed by ELISA method (EUROIMMUN, Germany). The levels of antibodies were positive, then the COVID-19 disease was confirmed. This test detected antibodies against the receptor binding domain of the SARS-CoV-2 spike protein. The results are given semiquantitave. The optical density reference value of the calibrator is 0.372, 0.302 for IgG and IgA respectively and the valid reference range >0.140 optical density. For the calculated value <0.8 negative, ≥0.8 to <1.1 limit value, ≥1.1 is considered positive. The specificities are 99.6% and 92.5% for IgG and IgA respectively. IgG and IgA were found positive, their semiquantitative values are 10.015 and 4.165 respectively.

At 39th week of pregnancy the delivery has occurred without complication. The baby was healty, her birth weight was 2820 gram. Umblical cord blood, placenta, amniotic fluid, nasopharyngeal swabs both of woman and her baby and colostrum were collected to analyse the SARS-COV-2 and antibodies. Breast milk sample was collected after the first lactation.

The samples were studied with the SARS-CoV-2 Real Time-q polimerase chain reaction (PCR) method. Nucleic acid isolation from nasopharyngeal swab and amniotic fluid samples was performed on the EZ1 Advanced (Qiagen, Germany) device using the EZ1® Virus Mini Kit v2.0 (Qiagen, Germany). Nucleic acid isolation from placenta tissue sample was performed using the QIAamp® Viral ribonucleic acid Mini Kit (Qiagen,Germany).

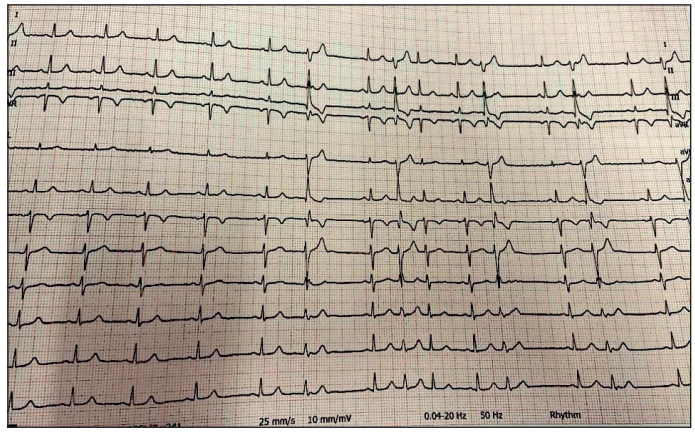

Figure 1: The electrocardiogram (ECG) showed ventricular extrasystoles. On ECG, the amplitudes and durations of P, QRS, T waves were normal.

The Real Time-qPCR was studied with the genesig® COVID-19 kit (PRIMER DESIGN, UK). The kit targets the ORF1ab gene region and the lower limit of detection is 0.33 copies/µl. The kit has been validated for the detection of SARS-CoV-2 human respiratory tract specimens. This was taken into account when evaluating the result of the placenta tissue sample and the amniotic fluid sample. The results were negative in all samples.

Antibodies were negative in samples other than breast milk. Breast milk IgG was negative, IgA was positive. IgA semiquantitative value was found 7.645, but control antibody tests result was negative one month later. PCR tests of nasopharyngeal swabs both of woman and her baby were ngative.

Anti-covid-IgG was still positive in the blood even a year later of COVID-19 without vaccination. Now the baby is 27 months old, she is healty. The antibody test was performed once after the birth when the baby was 12 months old and her control antibody was negative. Her growth parameters (weight, height, head circumference) and neurodevelopmental status are normal, according for her age.

Furthermore, the woman lived cardiac arrhythmia on second month of postpartum. The electrocardiogram showed ventricular extrasystoles (VES) (Figure). On ECG, the amplitudes and durations of P, QRS, T waves were normal. There were narrow VES examples with right axis. It was found 9773 VES on 24-hour cardiac rhythm holter monitorization. Hemogram, renal function tests, liver function tests, electrolytes, thyroid function tests, lipid profiles, cardiac biomarkers (troponine 1, creatinine kinase MB) were performed. The results were normal in range except lipid profiles. The levels of total cholesterol, low density lipoprotein were 255.163 miligram/deciliter respectively. Ecocardiography revealed no abnormality. The cardiologists adviced to start beta-blocker medicine. But the woman refused due to breastfeeding. She was feeling three days lasting palpitation once a week. She didn't feel arrhytmia for several. Control rhythm holter monitorization was normal. Her body mass index was 22.6 and she hadn't any other health problem.

DISCUSSION

Breastfeeding protects infants against infections mainly via secretory IgA antibodies. The anti-covid IgA was positive in the breastmilk when SARS-COV-2 PCR test of this case was negative. Control value was negative one month later in the breast milk even the anti-covid-IgG antibodies higly positive in the blood. The antibody levels are negative in umblical cord blood also. Although it is known that antibodies transmitted transplacental from the mother have protection in the baby up to six months, Both of these results showed that the effects of transplacental anti-Covid-IgG and breast milk anti-Covid-IgA antibodies did not last long. There is similar case in the litherature (5). Furthermore, both virus PCR and antibodies analyses are negative in other samples, like placenta, umlical cord blood. It is not yet known how SARS-CoV-2 shedding occurs in breast tissue, and whether this viral ribonucleic acid represents infectious viral particles. It seems that, this virus and/or its particles can arrive to the breast tissue, causes inflammation and anti-inflammatory effect, although it is transient response. There is limited information on potential transmission of the infection from mother to child, particularly through breast milk. Generally there were no detected SARS-COV-2 in breast milk of the cases informed in the litherature, like this case (6,7). The benefits of breastfeeding is known well, therefore breastfeeding should be advised always, also during COVID-19 (8).

SARS-CoV-2 infects individuals by binding the spike protein on angiotensin-2 converting enzymes receptors and using the proteolytic host serine protease, transmembrane protease serine 2, for entry into the cell. Multiple tissue types in the placenta, including placental syncytiotrophoblast and cytotrophoblast, express these proteins starting at 7 weeks gestation, allowing for SARS-CoV-2 placental infection. These receptors are not highly expressed in fetal lung tissue, and are not present in fetal brain tissue. Despite the presence of the cellular machinery to facilitate placental and transplacental infection, such infection is rare (9). Mechanisms that protect from invasion of fetal tissue by SARS-CoV-2 are yet to be elucidated. Neverthless, neonatal complications can occur such as admission to neonatal intensive care units, preterm birth, cesarean section and low birth weight due to exposure in the thirth trimester of pregnacy (10). Fortunately, the health situation of the current baby was still normal. Therefore, we concluded that, SARS-COV-2 hadn't teratogenic effect on this baby and there weren't any fetal complications. Of course, we need more reports about the possibility of teratogenic effect of SARS-COV-2.

It's well known that, immunglobuline G antibodies can be transferred from mother to baby. In a study conducted that 76% of neonates from seropositive mothers had antibodies against SARS-CoV-2 in cord blood, of whom 56% had a SARS-CoV-2 negative test result at birth (11). Although, a positive association between maternal IgG levels with neonatal IgG levels was observed in that study, the IgG level in this current baby was negative while the IgG level positive in the mother.

We know that myocardial injury is the most common reported cardiovascular event in patients with COVID-19 (12). In terms of arrhythmia, atrial arrhythmias and bradyarrhythmia are the most common in the acute setting of COVID-19, with an incidence of 13 % and 12.8 % respectively. Furthermore, the atrioventricular block has been observed with an incidence of 8.6%, while ventricular arrhythmia was reported in 5.9% of cases, being the less predominant form (13). There is limited data about the effect of SARS-COV-2 on myocardial injury in pregnant women. A study showed that, COVID-19 induced myocardial injury and left ventricular dysfunction in pregnant women (14). Hovewer, study pointed that, it is not clear if the rate of cardiac injury in the study population was due to COVID-19 or pregnancy itself or systemic illness. To our knowledge, there is no information about post-Covid cardiac complication depended on COVID-19 during pregnancy. Most likely the VES etiology of this case was idiopatic but it may depend on post-covid complication.

In summary, there is limited knowledges related to vertical transmission of SARS-CoV-2 via breastfeeding, and intrauterin infection with SARS-CoV-2. Fortunately this case didn't have any problem during delivery and the baby was healthy. This report describes exposed fetus by SARS-COV-2 during third trimester of pregnancy and the situation regarding immunity to this virus in human milk. The number of reports are on the rise and we are learning better the COVID-19, but many questions still require answers, as clinical outcomes of pregnant women with COVID-19 infection and long-term follow-up of the baby born to a mother with COVID-19 disease.

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