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Case Report

Analysis of Breast Milk for Vertical Transmission of COVID-19: A Case Report

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Abstract

In December 2019 a new disease called COVID-19 emerged in China, this disease spreads quickly and on January 30, 2020, it was declared the Public Health Emergency of International Importance. On March 11, 2020 the World Health Organization featured COVID-19 as pandemic [1]. Many women who breastfeed and have been infected with covid-19 are the target of a common doubt. Can breastfeeding put the child's life at risk? We have few reported cases where breast milk is studied to discover the possibility of transmission of SARS-COV2 through breastfeeding. For this reason, we decided to share this case study. In this case, the patient is a mother and breastfeeding a child of 2 years and 5 months, does not report previous illnesses or comorbidities, exposed to contact with people contaminated with COVID-19 daily. The patient reports that starts with symptoms of sore throat, dry cough, and a few days later, she also had mild dyspnea and fatigue. A chest Computed Tomography image scan was performed and the result was within normal standards, but the RT-PCR swab test performed in the sequence resulted positive, detected for SARS-COV2. This patient is placed in isolation, evolved with COVID-19 Mild Disease, according to guideline from the Centers for Disease Control and Prevention-CDC [2]. During the isolation period, breast milk was collected. This material was sent for study, and performed RT-PCR tests (a real-time reverse transcription polymerase chain reaction RT-PCR, test for the qualitative detection of nucleic acid from SARS-CoV-2) in breast milk simple was not detected the presence of SARS-COV2.

Background

In December 2019, the coronavirus disease (COVID-19) emerged in China and began spreading rapidly. The World Health Organization (WHO) declared on January 30, 2020 that the outbreak of the disease caused by the new coronavirus (COVID-19) constitutes a Public Health Emergency of International Importance. On March 11, 2020, The World Health Organization characterized COVID-19 as pandemic [1]. In March 2020, Yuanyuan and colleagues published an epidemiological study with 2135 pediatric patients with COVID-19 reporting. More than 90% of all patients had asymptomatic, mild, or moderate cases. An analysis of the severity of the disease by age was also performed and reveals that young children, particularly infants, were vulnerable to 2019-nCoV infection [2]. Vertical transmission is the transmission of an infection or disease from the mother to her fetus in the womb or newborn during delivery. The main routes of contagion are pregnancy, childbirth and breastfeeding. Breastfeeding is a practice promoted by the world health organization and The United Nations Children's Fund-UNICEF [3]. So far have few reported cases of analysis of covid-19 in breast milk, and some questions are raised: It's possible the vertical transmission of the covid-19 through breast milk? To understanding these issues raised, this study report the transmission of SARS-COV2 through breastfeeding - because it is a subject, often omitted in the few studies we have at the moment on vertical transmission.

Case Presentation

Female patient, 35 years old, breastfeeding a child, health professional, exposed to contact with people contaminated with COVID-19 daily, does not report previous illnesses or comorbidities. The patient reports that starts with symptoms of sore throat and dry cough on May 2, 2020 and a few days later, she also had mild dyspnea and fatigue. A chest Computed Tomography image scan was performed on May 6 and the result was within normal standards, but on the following day, RT-PCR swab test resulted positive for SARS-COV2. The patient is placed in isolation, evolved with COVID-19 Mild Disease. On May 15, the patient still had mild symptoms such as dyspnea and fatigue on this date the breast milk was collected using personal safety equipment, such as hair caps, face masks and gloves, the breast was properly cleaned. The milk was removed from the breast using a pump previously sterilized manual. The content was placed in a sterile container and immediately sent to the analysis team. All precautions to avoid contamination of breast milk during collection for analysis were taken according to guidelines [4]. This material was sent for study, and performed RT-PCR tests (a real-time reverse transcription polymerase chain reaction RT-PCR, test for the qualitative detection of nucleic acid from SARS-COV2) in breast milk simple. The result of the RT-PCR test performed on breast milk was negative, was not detected the presence of SARS-COV2.

Discussion

We found 23 reported cases, all performed COVID-19 RT-PCR tests-(A real-time reverse transcription polymerase chain reaction RT-PCR, test for the qualitative detection of nucleic acid from SARS-COV2) in breast milk simple, all with a negative result [5-12].



- Chen H and colleagues tested on the breast milk of 6 mothers contaminated with COVID-19 and all obtained a NEGATIVE result [5].
- Piersigilli F and colleagues tested SARS-COV2 RT-PCR on a maternal milk sample obtained a NEGATIVE result [6].
- Peng Z and colleagues tested a patient's breast milk for 8 consecutive days and within 8 days the result was NEGATIVE [7].
- Yang Li and colleagues did the test in maternal milk of a patient contaminated with covid-19, they tested for 3 consecutive days and during the 3 days all tests were NEGATIVE [8].
- Cuifang Fan and colleagues did the test to detect the SARS-CoV-2 in breast milk of 2 mothers admitted to the hospital and the 2 tests were NEGATIVE [9].
- Wang S and colleagues make test in mother's breast milk sample with covid-19 and the result was NEGATIVE [10].
- Wei L and colleagues analyzed the milk sample of 10 women and the 10 samples returned NEGATIVE for COVID-19 [11].
- Guan-Jing L and colleagues did multiple repeated tests on a mother's breast milk with covid-19 and all tests were negative [12].

One article from the Italian Journal of Pediatrics published in 29 April 2020 por D.U. Roseand and colleagues [13] says: "due to the limited number of cases and clinical evidence, pediatricians should continually update their knowledge and be aware of the risks in particular in the high-risk population of newborn and preterm infants". Ling Ni and colleagues [2] on 03 May 2020 publish um article that analyzed the blood samples from 14 patients who recently recovered from COVID-19, they detected SARS-COV2-specific humoral and cellular immunity in 8 newly discharged patients. Follow-up analysis on another cohort of six patients 2 weeks post discharge also revealed high titers of immunoglobulin G (IgG) antibodies. On 27 March 2020, Akram Amin Jafari and colleagues [14] studied from the Possible of immunotherapy for COVID-19 and concluded: "Immunotherapy is an efficient therapeutic option intervention against COVID-19 and the main methods in this regard such as using immunoglobulins and plasma therapy have improved clinical outcomes in COVID-19 infected patients". The article sent to MedRxiv on May 8, 2020, published preliminary data from detailed analysis of maternal milk from patients recovered from COVID-19 illness [15]. They did a preliminary analysis in 15 milk samples obtained from donors previously infected with SARS-COV2, in this analysis they proved a high immunological response, suggesting that immunity against COVID-19 is transferred from mother to child through breastfeeding [15].

Conclusion

This study conducted a search for the presence of the SARS-COV2 virus in the breast milk of an infected patient and returned negative for the presence of the SARS-COV2 virus in breast milk [5-12]. Suggesting that vertical transmission through breast milk is unlikely. We know that transmission during breastfeeding can also occur horizontally, so care during breastfeeding should be maintained to avoid contamination. Recent studies show that people previously infected with COVID-19 develop an immunity against this disease, and some researchers suggest that Immunotherapy is an efficient therapeutic option intervention against COVID-19 [2,14]. We know that the mother's immunity is transmitted to breast milk. However, we found only 1 study with tests on breast milk of mothers recovered from COVID-19, and this study pointed to a very promising result where milk had high immunity for COVID-19 [15], however, as a recent topic, this subject requires more extensive and detailed research to analyze the effectiveness of this immunity acquired through breast milk to children [16,17].

Declaration of Interests

We declare no competing interests.

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