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Research Article

Covid 19 Infected Mothers and Antibodies Transmission to Their Babies

Ashraf Mohamed Safwat Ibrahim*

Department of Obstetrics and Gynecology, Consultant of Obstetrics and Gynecology and IVF, Cairo, Egypt

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ABSTRACT

Previous studies on the outbreak caused by the 2019 novel coronavirus disease (COVID-19) were based on information from the general population. Limited data are available for pregnant women with COVID-19. This study aimed to evaluate the antibodies transmission to babies from their mothers.

Methods: Clinical records, laboratory results, and chest CT scans were retrospectively reviewed for 18 pregnant women with laboratory-confirmed COVID-19 (i.e., with maternal throat swab samples that were positive for severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]) who were admitted from 20 Marsh to 16 May 2020 in one of the hospitals in Cairo, Egypt. Evidence of antibodies transmission was assessed by testing for the presence of SARS-CoV-2 IMG, IMG, and neonatal samples after labor.

Findings: All 18 patients had a caesarean section in their third trimester. most of the babies had a 1-min Apgar score of 8-9 and a 5-min Apgar score of 9-10. All samples tested negative for the virus.

Interpretation: Findings from this small group of cases suggest that there is currently no evidence for intrauterine infection caused by vertical transmission in women who develop COVID-19 in late pregnancy.

Introduction

Coronavirus disease 2019 has grown quickly around the world. Despite a dramatic spike in the rate of outbreaks, the rate of pregnant women and infants despite COVID-19 is also on the rise. However, only 19 neonates born to infected mothers have been studied and, to our knowledge, no research on maternal antibody transmission has been given. In February 2020, IgM antibodies to the severe acute respiratory coronavirus 2 syndrome (SARS-CoV-2) are involved [1]. A previous study of 9 pregnant women and their infants on March 4, 2020 found no maternal-child transmission of SARS-CoV-2 reliant on reverse transcriptase-polymerase chain reaction (RT-PCR) [2]. These updated guidelines have been extended to 18 pregnant women with reported COVID-19 and their children, as serological standards will provide for a more thorough examination of infection in newborns.

Methods

In this report, all fetuses born to pregnant mothers with COVID-19 were accepted by the local medical ethics committee. Legal written consent was received from the guardians of the neonates. Diagnosis and treatment of newborns with or at risk of COVID-19 follows the recommendations issued by the National Health Commission and the Perinatal-Neonatal SARS-CoV-2 Committee [3, 4]. Data on social, epidemiological and therapeutic characteristics is collected from the Medical Records Program. In addition, coronavirus 2 Clinical records and laboratory results were retrospectively checked for 18 pregnant women with COVID-19 admitted to one of the hospitals in Cairo, Egypt from 16 March to 26 May 2020, verified on the basis of symptoms, chest CT In addition, coronavirus 2 Clinical records and laboratory results were retrospectively reviewed for 18 pregnant women with COVID-19, confirmed based on symptoms, chest computed tomography and positive RT-PCR results.

**Correspondence to: Ashraf Mohamed Safwat Ibrahim, M.D., Department of Obstetrics and Gynecology, Consultant of Obstetrics and Gynecology and IVF, Cairo, Egypt; E-mail: ahmed.elanour@med.asu.edu.eg*

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Blood samples were obtained from mothers during conception and neonatal blood and throat swab samples were taken during birth. Quantitative RT-PCR for SARS-CoV-2 nucleic acid (RT-PCR Kit) was conducted on neonatal serum and throat swabs. Inflammatory cytokines (CBA Human Th1/Th2 Cytokine Kit II) were tested for neonatal serum. Samples of maternal and neonatal sera is used to monitor for IgG and IgM antibodies. All tests were performed with double-checked samples of SARS-CoV-2 IgG and IgM from infants. Sample collection, processing and laboratory testing followed guidance from the World Health Organization [3]. The sensitivity and specificity reported by the manufacturer for IgM is 88.2 per cent and 99.0 per cent, respectively, and for IgG is 97.8 per cent and 97.9 percent [4].

Results

These 18 mothers have moderate psychiatric signs. Each of them required cesarean deliveries owing to the complications of their mothers in their third trimester in Extreme enclosed vacuum rooms. Both mothers wore helmets, and all emergency staff wore double helmets and security suits. Shortly after conception the children became detached from their mothers.

Table 1 showed maternal character and clinical presentation of them most complaints were dyspnea in 5 of them and diarrhea in 3 of them others were cough, sore throat, malaise and myalgia. The 18 infants had Apgar scores of 8 to 9 and Apgar scores of 9 to 10 in 1 minute and 5 minutes. All had negative RT-PCR tests on neonatal throat swabs and blood samples. Both 18 children had antibodies found in their serums. Five children had higher concentrations of IgG and IgM than average (< 10 AU/mL). 2 of these infants had IgG level 125.5 and IgM level 38.2AU/mL; three infants had IgG level 113.1 AU/mL and IgM level 16.2 AU/mL (Table 2). Their mothers often had elevated IgG and IgM rates (Table 3). Nine babies had elevated IgG rates (75.4, 73.1, 51.3 AU/mL) with regular IgM rates; all 9 mothers had elevated IgG levels and 5 still had elevated IgM levels. Inflammatory cytokine IL-6 has been dramatically improved in all children. At the time of the test, neither of the children had any signs.

Table 1: Maternal characteristics from 18 pregnancies with confirmed SARS-CoV-2 infection.

Fever on admission	4
Cough	1
Malaise	1
Dyspnea	5
Myalgia	2
Sore throat	2
Diarrhea	3
Lymphocytopenia ($<1 \times 10^9$/L)	18
Elevated C-reactive protein concentration (mg/L)	18
Maternal mortality	0
Maternal ICU admission	3
Neonatal mortality	0
Intrauterine fetal death	0

Table 2: Antibody and IL-6 Levels in Infant Sera Samples.

Clinical value	Reference range	Infant numbers					
		2	**3**	**3**	**4**	**2**	**4**
IgM, AU/mL	<10	38.2	16.2	3.7	1.77	0.9	0.16
IgG, AU/mL	<10	125.5	113.	75.4	73.1	51.3	7.25
IL-6, pg/mL	0.1-2.9	15.0	33.0	19.1	18.1	32.7	19.6

Mothers and infants correspond by number between tables.

Table 3: Antibody Levels in Mother Sera Samples.

Clinical value	Reference range	Mother numbers					
		2	**3**	**3**	**4**	**2**	**4**
IgM, AU/mL	<10	83.9	236.0	5.5	33.2	15.0	1.3
IgG, AU/mL	<10	136.72	117.37	120.63	103.46	70.05	8.12

Mothers and infants correspond by number between tables.

Discussion

Between the 18 confirmed COVID-19 mothers, none of their newborns contained SARS-CoV-19 in the serum or throat swab with RT-PCR. Nonetheless, the collection of neonatal blood samples has had virus-specific antibodies. In 14 babies, IgG concentrations were elevated. IgG moves through the placenta gradually from mother to infant beginning at the end of the second trimester and then responding [5, 6].

Nevertheless, due to its larger macromolecular structure, IgM, which was present in 5 infants, is not usually transferred from mother to fetus. In 6 Mothers with SARS, the placenta of 5 people convalescing SARS-CoV infection had irregular weights and pathology during the third trimester of pregnancy. Whether women's placentas have been impaired and irregular in this sample is unclear. We assume the baby would have developed IgM instead, if the virus crossed the placenta. This research is constrained by low sample size, loss of cord blood, amniotic fluid, and breast milk, and insufficient knowledge on the results of babies. Such results are important for understanding the serological characteristics of infants whose mothers are infected with SARS-CoV-2, and further research synthesis.

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