



Case Report

Lack of Vertical Transmission of SARS-CoV-2 from an Infected Mother to Her Newborn during the Third Trimester of Pregnancy

Yanrong Wang^{1*}, Xianfeng Wang², Junxia Xia³, Miao Wang³

¹Department of Neonatology, The Third People's Hospital of Shenzhen, The Second Hospital Affiliated to Southern University of Science and Technology, Shenzhen, China

²Department of Pediatrics, The Third People's Hospital of Shenzhen, The Second Hospital Affiliated to Southern University of Science and Technology, Shenzhen, China

³Department of Obstetrics and Gynecology, The Third People's Hospital of Shenzhen, The Second Hospital Affiliated to Southern University of Science and Technology, Shenzhen, China

***Corresponding author:** Yanrong Wang, Department of Neonatology, the Third People's Hospital of Shenzhen, the Second Hospital Affiliated to Southern University of Science and Technology, Shenzhen 518020, China

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Abstract

Background: SARS-CoV-2 is a novel pandemic virus. There is mounting evidence supporting the possibility of vertical transmission. **Case:** A pregnant woman with SARS-CoV-2 infection was admitted in a designated hospital in her 33th week of pregnancy and was discharged 10 days later. A male newborn was delivered vaginally in her 40th week. The newborn was negative for SARS-CoV-2 RNA and positive for SARS-CoV-2 Immunoglobulin G and was followed-up for 1 year without development retardation. **Summary and Conclusion:** Mother-to-fetus transmission seems to be rare for this virus. Especially during the third trimester of pregnancy, there is no effect on fetus's growth and development.

Keywords: Newborn; Pregnant woman; SARS-CoV-2; Vertical transmission

Introduction

SARS-CoV-2 is a novel pandemic virus. The possibility of in utero transmission is highly controversial [1,2]. Although it is unsure that vertical transmission reporting will increase abortion, explanation of potential effects might be useful to assure the public that they could take a proper choice.

Case

A 27-year-old woman presented at 28 weeks of gestation with mild fever and without dry cough, dyspnea and fatigue. She did not go to the clinic and recovered spontaneously within 2 days. One month later, the woman had a routinely pregnancy check-up in a maternity and child healthcare hospital. Her Nasopharyngeal

(NP) swab tested positive for SARS-CoV-2 by isothermal amplification (GeneoDX Co., Ltd., Shanghai, China). She was admitted in a designated hospital in her 33th week of pregnancy.

The questionnaire was administered to determine the timeline of her virus infection. The report had been approved by the ethics committee of the Third People's Hospital of Shenzhen, and informed consent was obtained. From January 16, 2020 to February 3, 2020, she and her husband visited her parents who lived in Hubei Province. Her mother had a fever on February 3, 2020 and was diagnosed as COVID-19 on February 8, 2020 and quarantined in a hospital. However, both the pregnant woman and the husband tested negative for SARS-CoV-2 twice even though the pregnant woman had a mild cough. The spouse returned Shenzhen on March 28, 2020. The pregnant woman tested positive for SARS-CoV-2 RNA and the husband tested negative on April 6, 2020.

Routine admission labs were negative, including human immunodeficiency virus, syphilis, influenza A and B viruses and respiratory syntactical virus. She was diagnosed with asymptomatic COVID-19 and received no therapy. On April 14 (day 8 of hospitalization), SARS-CoV-2 RNA tested negative in the woman’s NP, serum tested positive for SARS-CoV-2 Immunoglobulin G (IgG). 10 days later, she was discharged. In her 40th week of gestation, she was admitted again. Her NP swab tested negative for SARS-CoV-2 and serum tested positive for SARS-CoV-2 IgG. A male infant was delivered vaginally with a birth weight of 3340 g. Figure 1 presented the timeline of events about the pregnant woman.

Result											
Symptom	No	fever	No	No	No	mild cough	No	nasal obstruction	No	No	No
Site	HB	HB	HB	HB	HB	HB	HB	SZ	SZ	SZ	SZ
Date	2020/1/16	2020/1/29	2020/1/30	2020/2/3	2020/2/8	2020/2/9	2020/2/16	2020/3/29	2020/4/6	2020/4/14	2020/5/30

Figure 1: The timeline of events about the pregnant woman. HB: Hubei Province; SZ: Shenzhen City.

The delivery was uncomplicated. Agar scores were 9, 10 and 10 at 1, 5 and 10minutes of life, respectively. The newborn appeared well and the vital signs were normal. A blood culture was obtained and vital signs were closely monitored. The newborn roomed in with the mother. The mother attempted breastfeeding during the first day. When breastfeeding, the mother was instructed to wash hands and breasts prior to each feed and wear a surgical mask.

SARS-CoV-2 testing was obtained on the newborn at 24 hours of life. The newborn’s NP swab tested negative for SARS-CoV-2 RNA and serum tested positive for SARS-CoV-2 IgG at 24 hours of life. The mother’s urine, feces, umbilical cord blood, amniotic fluid and placenta, and breast milk samples were negative for SARS-CoV-2 RNA. The pathological examination of placenta was done to find out multifocal inflammatory necrosis, fibrinoid necrosis and ischemic infarction. The mother and the newborn were discharged on day 5. The infant was followed-up for 1 year without growth and development retardation (weight of 10.3 kilogram/height of 78.5 centimetre/head circumference of 45 centimetre at the age of one year old).

Summary and Conclusion

The probability of mother-to-fetus transmission of SARS-CoV-2 is highly debated in perinatal medicine community [3]. Although some experts have denied the risk of intrauterine transmission, others still paid attention to this risk [4] and there are a few case reports about the suspected vertical transmission of

COVID-19 [5,6]. Our infant had negative SARS-CoV-2 RNA and IgM, positive SARS-CoV-2 IgG on day of life 1, which attribute to maternal origin.

Pregnant women are also susceptible to SARS-CoV-2. Limited data showed that pregnant women are more prone to complications [7]. We still do not know the effect of infection on fetus during different stage. Data from the third trimester of pregnancy indicated that there is no mother to child transmission. The baby’s outcome also explained the viewpoint.

We analyzed the epidemiological history of the pregnant woman and speculated that the pregnant woman infected SARS-CoV-2 during her stay in Hubei Province in spite of the first negative SARS-CoV-2 RNA. It seems difficult to ascertain whether the pregnant woman infected her mother or conversely the mother infected the pregnant woman. The first negative SARS-CoV-2 RNA may imply that the pregnant woman was in the early phase of COVID-19 or the viremia was low in the early stage of SARS-CoV-2 infection, which may contribute to the favorable pregnant outcome.

In spite of the mother’s negative SARS-CoV-2 RNA, the neonatal umbilical cord was cut off immediately and the infant was cleaned and transferred to an isolation ward with his mother. The infant was breastfed after birth for breast milk samples were negative for SARS-CoV-2 RNA.

In conclusion, we report a pregnant woman with SARS-CoV-2 infection who delivered a healthy newborn, suggesting that

mother-to-child transmission is unlikely for this virus. Especially during the third trimester of pregnancy, there is no effect on fetus's growth and development.

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