SHORT COMMUNICATION

Asymptomatic COVID-19 infection in late pregnancy indicated no vertical transmission

Dawei Lu1 | Lin Sang1 | Shihua Du1 | Tao Li1 | Yange Chang2 | Xiu-An Yang2

1Department of Obstetrics and Gynecology, The No. 2 People’s Hospital of Hefei City Affiliated to Anhui Medical University, Hefei, China
2Department of Biochemistry, School of Basic Medical Science, Chengde Medical University, Chengde, China

Correspondence
Xiu-An Yang, School of Basic Medical Science, Chengde Medical University, Anyuan Road, 067000 Chengde, China.
Email: yangxiuan07@mails.ucas.edu.cn

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Abstract
This study is to investigate the clinical characteristics of late pregnancy with asymptomatic 2019 novel coronavirus disease (COVID-19) infection, evaluate the outcome of maternal and fetal prognosis, and identify the evidence of intrauterine vertical transmission. A 22-years-old pregnant woman with asymptomatic COVID-19 infection who was admitted to our hospital on 11 February 2020 was enrolled in this study. Clinical data including laboratory test results and chest computed tomography (CT) scanning were collected and reviewed. Diagnosis of late pregnancy with asymptomatic COVID-19 infection was made. Lumbar anesthesia for cesarean section was performed and a female baby was delivered uneventfully, with the Apgar score of 9 to 10 points. Three times of COVID-19 nucleic acid test for the baby was negative after delivery. The puerpera returned to normal after the operation and two times of throat swab COVID-19 nucleic acid test were all negative after antiviral therapy. We reported an asymptomatic COVID-19 pregnant woman with detailed clinical information and our result indicated that for late pregnant women with asymptomatic COVID-19 infection, there might be no intrauterine infection caused by vertical transmission.

KEYWORDS
asymptomatic COVID-19 infection, intrauterine infection, late pregnancy, vertical transmission

1 | INTRODUCTION

Currently, 2019 novel coronavirus disease (COVID-19) pneumonia cases have been diagnosed in many countries and the severe cases have rapidly developed into respiratory distress, shock, sepsis, and even death.1,2 The WHO has announced that the outbreak of COVID-19 pneumonia is a pandemic on 11 March 2020 (https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020). With the spread of COVID-19, pregnant women are at greater risk because they have a worse prognosis than nongraviditas lady once they got respiratory syndrome.3,4 As of 28 March 2020, a total of 38 cases of pregnant women were reported and it seems no evidence that COVID-19 undergoes intrauterine or transplacental transmission, however, further studies with a large sample size are needed to confirm this conclusion.5–9

To the best of our knowledge, pregnant women with asymptomatic COVID-19 infection are rarely reported. Herein, we report the first pregnant patient from Anhui Province of China with asymptomatic COVID-19 infection. We aimed to analyze the clinical characteristics of a COVID-19 infected pregnant woman to provide clinical data for understanding the maternal and neonatal outcomes and evaluating the existence of vertical transmission. Besides, combined with the characteristics of the Obstetrics and Pediatrics Department, we intend to provide a theoretical basis for obstetrical
management issues including the mother and fetus monitoring, treatment plan, timing and mode of pregnancy termination, and neonatal care.

2 | CASE REPORT

This study was approved by the ethics committee of The No. 2 People’s Hospital of Hefei City Affiliated to Anhui Medical University and informed consent was obtained from the patient before the study. A 22-year-old G1P0 woman, who was enrolled in this study, was 38 weeks pregnant. Regular prenatal check-up during pregnancy was performed before admission and no abnormality was discovered. COVID-19 pneumonia was confirmed in her husband and sister, therefore, routine inspection of COVID-19 nucleic acid using quantitive reverse-transcription polymerase chain reaction was performed with her throat swab on 7th February. A positive result was achieved on 10th February. As a result, she was admitted to our hospital on 11 February 2020. On admission, no clinical features of COVID-19 were noted. The abdominal incision was healed well. On 21 February, CT reexamination showed a small amount of pleural effusion on both sides (Figure 1D-F). Recombinant Human Interferon α-2b (5 000 000 IU, atomization inhalation, bid) and Arbidol (0.2 g, administered orally, tid) were used for antiviral treatment from 22 February. Throat swab nucleic acid tests on 24 and 25 February were all negative.

The newborn was delivered 5 minutes after the operation started, with Apgar scores of 9 to 10 and a weight of 3470 g. After the umbilical cord was broken, she was quickly handed over to the nurse outside the operating room for cleaning. Amniotic fluid, umbilical cord, or placenta was not used for the COVID-19 nucleic acid test owing to the emergency operation, however, the COVID-19 nucleic acid test on nasopharyngeal swabs, oropharyngeal swabs, and blood was performed immediately after delivery. As shown in Table S3, all the results were negative. The newborn was kept in a warm box in the isolation intensive care unit of the neonatal nursery. She was fed artificially without any contact with his mother after birth for 14 days. Nucleic acid test performed 24 hours after the first sampling was negative (Table S3). During the 14 days of the observation period, the body temperature of the newborn was normal, without cough, dyspnea, or diarrhea occurred. She had good milk intake and stool nucleic acid test was negative on the sixth day after birth. No abnormality was noted in CT on 26 February (Figure 1G-I), and she had been removed from close medical observation on 27 February.

The puerperal and her fetus discharged on 27 February and complied with home quarantine. Throat swab nucleic acid test was negative 14 days after they left the hospital. All the personnel involved in the operation were observed for 14 days. The nucleic acid test on throat swab results was negative for twice, and chest CT scanning was normal.

3 | DISCUSSION

It is well documented that pneumonia in pregnant women may have more adverse outcomes (spontaneous abortion, intrauterine growth retardation, premature birth, etc) and the mortality rate of pregnant women is as high as 25%, far higher than that of the general infected population. We, herein, reported the first case of pregnant women in Anhui Province of China with asymptomatic COVID-19 infection. To the best of our knowledge, asymptomatic COVID-19 pregnant women with detailed information are rarely reported. She had no fever, cough, or dyspnea, and blood routine examination showed normal white blood cell count and normal lymphocyte count. The results of the chest CT examination before and after operation...
indicated only a small amount of pleural effusion, which may be caused by hypoalbuminemia.

The patient showed asymptomatic infection before the operation, considering that there was no specific antiviral drug for COVID-19 infection and antiviral drugs may have hidden dangers for the safety of the fetus, only conventional treatment including oxygen inhalation and oral iron was performed. After the operation, she did not breastfeed her infant, therefore, antiviral therapy was performed. At present, there are no effective antiviral drugs for COVID-19 infection. The clinical treatment is mostly oxygen inhalation, anti-infection, nutritional support, and other symptomatic treatment. Lopinavir, ribavirin, chloroquine phosphate, and Arbidol were recommended by the Management for Diagnosis and Treatment of COVID-19 (sixth edition) edited by the National Health Commission of the China (http://www.nhc.gov.cn/yzwj/s7653p/202002/8334a8326dd94d329df351d7da8ae2.shtml, in Chinese). Arbidol, Lopinavir, and Ritonavir were used for COVID-19 infection pregnant woman treatment by Wang et al7 and obtained good effect. For our patient, the combined use of Interferon α-2b and Arbidol was performed and the nucleic acid quickly turned negative on the third day. At the same time, no adverse reactions such as nausea, diarrhea, and transaminase elevation were noted. The possible reasons were as follows: (a) the drugs were effective; (b) the patient was a young woman with strong self immunity. In short, our study provided a clinical experience for clinical treatment, especially the use of antiviral drugs. It should be noted that the efficacy of antiviral drugs is still uncertain and the side effects need further clinical observation and evaluation.

FIGURE 1 Chest computed tomography (CT) scanning for the mother and her fetus. CT scanning on 13 February (A-C) and 21 February (D-F) showed a small amount of pleural effusion on both sides. No abnormality was noted in CT for the infant on 26 February (G-I)
In our case, amniotic fluid was clear and the placental tissue was complete. No intrauterine infection was found in the fetus after three times of virus nucleic acid test, and the outcome of her was good, which was consistent with previously reported cases.6,7 Our study supported the idea that no evidence of intrauterine or transplacental transmission for COVID-19 exists, however, this conclusion has yet to be further validated due to the small sample size.5 It should be pointed out that we did not detect the viral nucleic acid in amniotic fluid and placenta, which will be the focus of our further study.

The indication of pregnancy termination depends on gestational age, complications, and the intrauterine fetal condition but not COVID-19 infection. Due to the small number of cases, which mode of delivery is safer has not been determined, however, it is suggested to relax the indications of cesarean section.11 For our patient, considering that vaginal delivery might lead to amniotic fluid pollution in the birth canal and increase the risk of neonatal infection, the multidisciplinary team of our hospital decided to carry out an emergency cesarean section. Similar to previous reports,6,7 no adverse prognosis in the puerpera and newborn was noted, suggesting that our preoperative evaluation was correct.

Although pregnant women are susceptible and high-risk groups of virus infection, the outcomes of our patient and her fetus were different from those of pregnant women infected with SARS in 2003.5 However, further studies with larger samples are needed to validate the suitable delivery mode for pregnant women with COVID-19 infection. At present, both the puerpera and the newborn have been discharged from the hospital and were still isolated at home. According to the standard requirements of diagnosis and treatment (http://www.nhc.gov.cn/zytyjg/s7653p/202002/8334a8226dd94d329df351d7da8a4f2.shtml), they received throat swab sampling for virus nucleic acid test again and the result was negative.

A recent study indicated that asymptomatic patients may have a similar transmission potential comparing with symptomatic patients.12 Therefore, all the medical staff participating in the operation received COVID-19 safety training before the operation. It should be noted that although our hospital is a designated hospital for COVID-19 infection patients, we have no recommended negative pressure operation room. As a result, cesarean section surgery was performed in a common isolation operation room in our hospital. To reduce the formation of aerosols, all operations are gentle to avoid the splashing of amniotic fluid blood. Surgical instruments, especially sharp tools such as blades, stitches, and syringes, were delivered in a noncontact way. At the same time, to prevent poor uterine contraction and bleeding during the operation, oxytocin and contractile drugs should be used as early as possible to prevent postpartum hemorrhage after the delivery of the fetus, which also provides better support for the recovery of the puerpera. Our study suggests that it is feasible to collect prenatal patients with COVID-19 infection in hospitals without negative pressure operating room.

In summary, asymptomatic COVID-19 infection and maternal prognosis in one case of late pregnancy infection were reported in this study. Direct evidence of vertical transmission of the uterus in late pregnancy was not found. As data on COVID-19 related maternal and child are still lacking, further analysis is needed to expand the clinical sample size.

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CONFLICT OF INTERESTS
The authors declare that there are no conflict of interests.

ORCID
Xiu-An Yang http://orcid.org/0000-0002-3485-0172
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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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