



Case Report

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COVID-19 pneumonia in an Iraqi pregnant woman with preterm delivery

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ABSTRACT

Rationale: Coronavirus disease 2019 (COVID-19) is a highly infectious disease due to the severe acute respiratory syndrome coronavirus type 2 (SARS-CoV2). Vertical transmission and clinical presentation of COVID-19 in pregnancy is still obscure. Additionally, the potential hazard of COVID-19 in pregnancy on the fetus and post-delivery risk for the neonate remain under investigations.

Patient concern: A young-aged Asian pregnant woman with 28 weeks of gestation presented with fever, dyspnoea, headache, and joint pain with decreased fetal movement for about one week.

Diagnosis: The patient was diagnosed with COVID-19 pneumonia.

Interventions: The patient was referred to the quarantine sector and was treated with chloroquine orally, intravenous fluid and other supportive treatment.

Outcomes: After one week of treatment, the patient improved. Seventeen days after admission to hospital and at 30 weeks of gestation, she started vaginal preterm delivery of a viable healthy neonate with negative COVID-19 test for two occasions.

Lessons: COVID-19 pneumonia during pregnancy presents with similar clinical presentation of non-pregnant women. COVID-19 pneumonia during pregnancy increases the risk of preterm labour without evidence of vertical transmission.

KEYWORDS: Coronavirus disease 2019 (COVID-19); Pregnancy; Vertical transmission

1. Introduction

Coronavirus disease 2019 (COVID-19) is a highly infectious disease caused by severe acute respiratory syndrome coronavirus type 2 (SARS-CoV2), leading to the ongoing outbreak[1]. In Iraq, the first case of COVID-19 was reported on 24 February, 2020 in Al-Najaf City. Subsequently, the number of infected cases tremendously increased to 1 232 infected cases by 9 April 2020.

Vertical transmission and clinical presentation of COVID-19 in pregnancy is still obscure. Also, the potential hazard of COVID-19 in pregnancy on the fetus and post-delivery risk for the neonate remain under sophisticated investigations. Different reports concerning management of COVID-19 in pregnancy failed to collect vaginal secretions, placenta tissues, and amniotic fluid samples which are necessary for assessment of vertical transmission. However, Chen *et al* reported that clinical presentation of COVID-19 pneumonia in pregnancy was not differed from that of non-pregnant women. In addition, they disclosed there was no any evidence for vertical transmission, based on the investigation regarding amniotic fluid sample and first lactation milk[2]. As there is 96% similarity between SARS-CoV2 and SARS-CoV1[3], SARS during pregnancy leads to significant maternal-fetal complications including acute kidney injury, disseminated intravascular coagulopathy, intrauterine death, abortion, preterm delivery and neonatal death. The case-fatality rate of pregnant women with viral pneumonia was reported previously. During influenza pandemic 1918-1919, the case-fatality rate in pregnant women was 27% in the first trimester and increased to 50% in the third trimester. During Asian flu epidemic 1957-1958, the case-fatality rate for pregnant women was 10%[4].

Therefore, this study presents clinical feature and management of pregnant women with confirmed COVID-19 pneumonia with suspected vertical transmission to premature baby.

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2. Case report

2.1. Presenting concerns

On 13 March 2020, a 25-year-old Iraq Muslim pregnant woman with 28 weeks of gestation presented to the antenatal care unit of Al-Kadhemia Teaching Hospital, Baghdad, Iraq, with fever (37.9 °C), headache, joint pain, dry cough, generalised weakness, and dyspnoea with decrease fetal movement for about one week. Review of systems was unremarkable. She worked as a senior doctor in the Department of Obstetrics and Gynaecology, Al-Kadhemia Teaching Hospital, Baghdad, Iraq.

Informed patient consent was obtained and this case-report study was approved (MT5 1 April 2020) by Medical Editorial Board in College of Medicine, Al-Mustansiriyah University, Baghdad, Iraq.

2.2. Clinical findings

Initial physical examination showed a conscious and febrile (37.9 °C) patient. Her blood pressure was 121/72 mmHg and heart rate was 97 beats per minute. Chest examination revealed abnormal lung sounds (bronchial sounds). Posterior-anterior chest radiograph showed bilateral broncho-pulmonary densities and bilateral pulmonary ground-glass appearance with prominent bronchovascular markings and reduction of fetal activity on abdominal ultrasound.

Complete blood profile was done by complete blood count, and biochemical measurements of blood glucose, blood urea and serum creatinine. Preliminary blood investigations showed haemoglobin 11.4 g/dL, total white cell count $11.34 \times 10^3/\mu\text{L}$, with 66% neutrophils, 22% lymphocytes, and platelet count $342 \times 10^3/\mu\text{L}$. Other biochemical measurements were within normal limits.

2.3. Diagnostic focus and assessment

All the investigations increased the suspicion of having COVID-19, so she was sent for COVID-19 testing, which was polymerase chain reaction (PCR). COVID-19 PCR test detected antigen-antibody reactions, which was either positive or negative. Twelve hours later, the results of two consecutive tests were positive, so the pregnant woman was referred to the quarantine sector, where she received chloroquine tablet 200 mg twice daily, intravenous fluid (glucose-saline), parental paracetamol (paracetamol infusion 1% w/v, 1 000 mg/100 mL infusion) and bronchodilator (salbutamol 2 mg tablet). Then, she stayed in quarantine sector for one week with continuous monitoring of her condition and her fetal condition through frequent abdominal ultrasonographic investigation.

2.4. Therapeutic focus and assessment

She illustrated gradual symptomatic improvement in term of decrease in her temperature (37.8 °C) and improvement in her shortness of breath as documented by internist physician. Her fetal movement returned to normal which was evaluated by physical

examination and abdominal ultrasonic imaging. PCR COVID-19 test was repeated twice 3 days apart and showed a negative result in both following eight days of therapy. Three days after the last negative result, the patient was referred back to the obstetric care unit for close observation for her fetal condition. On 30 March 2020, she started preterm labour (normal vaginal delivery of 30 weeks of gestation) of a viable male baby weighing 2.2 kg with cephalic presentation. Estimation of neonatal healthy status was done according to the score of appearance, pulse, grimace, activity, respiration (APGAR) score at 1 and 5 min after birth (APGAR score >7: normal; APGAR score 4-6: fair; and APGAR score <3: critical). The APGAR score of this delivered neonate was 8 and 9 at 1 and 5 min respectively with normal reflexes. The neonate was referred by the paediatrician to the neonatal care unit in an isolated incubator to be sending for COVID-19 PCR test. Twelve hours later, the result was negative, and the mother started breast feeding of her baby and was discharged home.

2.5. Follow-up and outcomes

An outpatient review and follow-up after 15 days after the delivery, which was done through dial-up the patients by mobile and whatsapp web, showed complete recovery with normal body activity. The patient returned to her prior physical fitness level and normal daily activities.

3. Discussion

Generally, immunological and physiological changes during pregnancy may increase the risk of maternal-fetal complications during respiratory viral infection. Reduction of lung capacity with immunological adaptation during pregnancy raises the risk of pregnant women to develop respiratory complications during viral infections. Furthermore, maternal mortality is high compared with non-pregnant women in different viral respiratory infections including respiratory syndrome (SARS) and Middle East respiratory syndrome.

In the current case, the young pregnant women at the third trimester with COVID-19 pneumonia was diagnosed by clinical presentation, laboratory and radiological findings, highlighting that pregnant women is at higher risk for the development of COVID-19 and other viral infections as in line of recent studies. Moreover, pregnant women at the third trimester are at a higher risk compared with those at the first and second trimester. Nonetheless, the current case was not associated with underlying cardio-metabolic complications, since diabetes mellitus, preeclampsia and hypertension augment the susceptibility for respiratory complications during acute respiratory viral infections. A previous study reported that patients with cardio-metabolic disorders are linked with high circulating plasmin level, which increases the susceptibility to COVID-19 pneumonia, as plasmin and other proteases activate surface protein of SARS-CoV2 during viral entry. Similarly, Lucena *et al* found that plasmin

level increased to 50% in the pregnant women compared with non-pregnant women[5], which may shed the light on the vulnerability of pregnant women to COVID-19 pneumonia. Unfortunately, plasminogen system was not evaluated in the present case report. In the past, the case-control study conducted by Lam *et al* illustrated that respiratory complications and acute respiratory distress syndrome were more common in the pregnant women during SARS and 40% of them required mechanical ventilation compared with 13% of non-pregnant women. However, the current case did not show any respiratory complications or the need for mechanical ventilation, which might be due to early diagnosis and treatment, as delay diagnosis of COVID-19 is associated with the development of acute respiratory distress syndrome due to cytokine storm[6].

On the other hand, early chloroquine and other supportive treatments in the reported case might play an important role in the rapid recovery and symptomatic relief. Chloroquine is regarded as first-line drug in the management of COVID-19 pneumonia in Iraq despite of precautions from the Food Drug Administration. Chloroquine was approved by the Food Drug Administration as anti-malarial agent. It is safe in pregnancy, effective against SARS-CoV2 through inhibition of viral entry, viral uncoating, blocking of viral post-translational modifications, with important immune modulations[7].

Regarding the delivery type, the woman in the current case delivered by normal vaginal delivery at 30 weeks of gestation as preterm delivery with a viable neonate. Preterm delivery is regarded as a chief outcome of COVID-19 pneumonia during pregnancy as reported in a recent study by Qiao[8]. The potential reason behind preterm delivery is not identified even so; FitzGerald gives robust evidence that SARS-CoV2 activates prostaglandins production *via* binding and provoking cyclo-oxygenase II enzyme. Therefore, high prostaglandins and other inflammatory mediators in COVID-19 with immunological over-expression might be the potential cause of premature uterine contraction and preterm delivery during COVID-19 pneumonia. In this case, paracetamol was used as analgesic and antipyretic. However, its effect on the replication of SARS-CoV2 was not evaluated, although reduction of prostaglandins by paracetamol may attenuate the antiviral activity of prostaglandins against replication different coronaviruses[9].

Moreover, the delivered premature neonate was healthy with negative test for COVID-19, which gives a clue of negative vertical transmission for SARS-CoV2 in COVID-19 during pregnancy. A retrospective review involving 19 pregnant women with COVID-19 pneumonia from Zhogan Hospital in Wuhan in China from 20-31 January 2020 showed that after testing of cord blood and amniotic fluid samples, the vertical transmission for SARS-CoV2 was negative for all pregnant women. Besides, Schwartz's study shows that following analysis of 38 pregnant women with COVID-19, there was no any infected neonate, with negative COVID-19 test. However, early in the epidemic there were two reported cases of neonatal COVID-19. The first one was 17-day-old neonate with history of contact with infected mother. The second one was 36-hour-old neonate with history of contact with infected personnel[10].

In conclusion, COVID-19 pneumonia during pregnancy shows similar clinical presentation of non-pregnant women. The severity of respiratory complications in the pregnant women is related with the underlying cardio-metabolic disorders. Also, COVID-19 pneumonia during pregnancy increases the risk of preterm labour without evidence of vertical transmission.

Conflict of interest statement

All authors declare that they have no conflict of interest.

Authors' contributions

All authors contributed equally in data collection, data acquisition and analysis, data interpretations, and manuscript writing. All authors approved the final version of the manuscript for publication.

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