Poor perinatal outcome in a woman with severe pre-eclampsia and asymptomatic COVID-19.

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Abstract

There is currently little known about the complex interaction between severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and pregnancy. Past data from MERS-CoV and SARS-CoV-1 indicated that infection was associated with an adverse neonatal outcome. A 20-year-old primigravida presented at 23 weeks gestation and was found to have severe pre-eclampsia complicated by HELLP syndrome (haemolysis, elevated liver enzymes, low platelets) and acute fatty liver of pregnancy (AFLP). She had no respiratory symptoms and only one documented elevated body temperature from the referring facility. She was subsequently found to be COVID-19 positive. Within several hours of admission, she had an intrauterine demise. Following delivery, her condition steadily improved. COVID-19 may worsen pre-eclampsia leading to an adverse outcome. Obstetricians should be aware of the possible negative impact of COVID-19 on hypertensive disorders of pregnancy and the need for further research on this complex relationship.

Keywords: SARS-CoV-2; COVID-19; pre-eclampsia; HELLP Syndrome

INTRODUCTION

In March 2020, the World Health Organisation declared coronavirus disease (COVID-19) a pandemic. Since then, there have been reports of a wide range of clinical presentations and eventual outcomes.

For pregnant women who have been infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), there are still many uncertainties about the risks posed to them as well as to the fetus. Allotey et al, in the PregCOV-19 Living Systematic Review, showed no evidence of an increase in stillbirth or neonatal death among women with COVID-19, although there was inadequate evidence to comment on the risk of miscarriage.[1] Others have reported that COVID-19 is associated with a high prevalence of preterm birth and caesarean section as well as pre-eclampsia.[2] Pre-eclampsia is a common disease of pregnancy but can have life-threatening complications such as HELLP syndrome (haemolysis, elevated liver enzymes, low platelets). Acute fatty liver of pregnancy (AFLP) is also included in the spectrum of hypertensive disorders of pregnancy and has a perinatal mortality rate of 104 per 100,000.[3]

CASE REPORT

We present a 20-year-old primigravida with no known medical history and a body mass index of 22 kg/m^2. She was transferred to our tertiary care hospital from a peripheral district health facility where she presented in a drowsy and confused state and complaining of abdominal pain.

This patient did not have any antenatal care prior to her admission. She was confused and uncooperative. Her BP was 175/115 on admission and remained elevated (>160/110) on repeated checks. She had significant proteinuria. A bedside ultrasound scan (USS) showed a single live fetus at 23 weeks' gestation.

Although she was afebrile on admission, there was a single elevated temperature of 37.9 degrees Celsius documented at the referring facility and a nasal swab for SARS-CoV-2 using reverse transcriptase PCR was done. She did not report any flu-like symptoms. She was managed in an isolation area while awaiting these results. Her temperature remained normal thereafter.

Laboratory investigations were abnormal as shown in Table 1. A CT scan of the head showed reversible encephalopathy syndrome. A diagnosis of severe pre-eclampsia with HELLP syndrome and AFLP was made. Magnesium sulphate was administered as well as hydralazine for her elevated blood pressure. Six hours following admission, repeat blood investigations showed a drop in platelet count to 79 x 10^9/L and a rise in white cell count to 22.6 x 10^9/L.

A decision was made for delivery. In our setting, 23 weeks' gestation is below our threshold for foetal viability, and termination of pregnancy was discussed with the patient. A further USS however showed no foetal cardiac activity, and a diagnosis of intrauterine demise was made.

The time from admission to this diagnosis was just over 12 hours. The patient was duly informed and counselled. The induction process was commenced, and she had a vaginal delivery of a stillborn infant almost 24 hours following admission.

Her condition improved and on the day after delivery, her swab result showed that she was COVID-19 positive. This time of approximately 48 hours to receive these results is not unusual in our public sector setting and highlights some of the challenges faced in management of these patients. As per national guidelines, she was then transferred to another state hospital designated for only COVID-19 positive patients, although our team continued her management while following all the necessary protocols. She was kept for a further 14 days during which she steadily improved. Although she remained well and normotensive with normal blood investigations on day 7 following delivery (Table 1), she was kept in quarantine in the state facility as per national guidelines and discharged on day 14 when her repeat COVID-19 swab test was negative.

DISCUSSION

Hypertensive disorders of pregnancy occur in 10 to 15% of all pregnancies and are a leading cause of maternal and perinatal morbidity and mortality. We have described the case of a pregnant patient who was simultaneously affected by severe pre-eclampsia

Table 1: Results of blood investigations on admission and 1-week post-delivery

Investigations (normal range)	Admission	1-week post-delivery
Full blood count		
Haemoglobin (11.7 – 15.5 g/dL)	10.6	10.4
White cell count (4.1-11.2 x 10^9/L)	17.8	12.5
Platelet count (156-373 x 10^9/L)	113	153
Renal function tests		
Blood urea nitrogen (6-23 mg/dL)	25	7.8
Creatinine (0.5-1 mg/dL)	1.3	0.6
Urate (2.4-5.7 mg/dL)	6.7	5.7
Liver function tests		
ALT (5-41 IU/L)	1135	218
AST (5-40 IU/L)	1353	68
ALP (35-104 U/L)	154	91
Total Bilirubin (0.0-1.2 mg/dL)	0.38	0.39
Albumin (3.5-5.2 g/dL	3.6	3.1
LDH (135-241 U/L)	1250	388
Clotting profile		
PT (9.5-13.5 s)	15.1	
PTT (27.0-35.0 s)	45.8	
INR (0.8-1.2)	1.4	

ALT, alanine aminotransferase; AST aspartate aminotransferase; ALP, alkaline phosphatase.

LDH, lactate dehydrogenase; PT, prothrombin time; PTT, activated partial thromboplastin time

with HELLP syndrome and COVID-19 at 23 weeks' gestation. In less than 24 hours from the time of admission, this patient's condition worsened, and she delivered a stillbirth. She also met the Swansea criteria for AFLP as she had more than six of following features in the absence of another explanation (abdominal pain, leucocytosis, coagulopathy, elevated transaminase, elevated urate, renal impairment and encephalopathy).[4] Her confusion was likely to be related to the encephalopathy caused by AFLP.

Reports show that COVID-19 can increase the risk of pre-eclampsia.[2] This is not entirely surprising since inflammation has been implicated in the pathogenesis of both hypertensive disorders of pregnancy as well as COVID-19. Therefore, it may be that the acute inflammation seen with SARS-CoV-2 can exacerbate pre-eclampsia. Endothelial damage and the release of proinflammatory cytokines, the commonly designated "cytokine storm" are also seen in both diseases.

Our patient's poor perinatal outcome may be as a result of increased severity of pre-eclampsia due to COVID-19, even though she did not have severe viral symptoms. However, we have also considered the lack of antenatal care prior to presentation to hospital which

may have been a contributory factor to the poor outcome. Alternatively, a recent study has shown that some pregnant women with severe COVID-19 can develop a syndrome that can mimic pre-eclampsia, while various biomarkers used to detect placental function remained within normal limits.[5]

The interactions between both diseases are still not completely understood. It may be that COVID-19 should be considered as a risk factor for hypertensive disease of pregnancy, including severe pre-eclampsia, HELLP syndrome and AFLP. Further research with larger patient numbers will be required to confirm this.

All healthcare providers should be aware of these likely scenarios and exercise caution while monitoring pregnancies with pre-eclampsia with a high degree of suspicion.

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Data availability: The authors declare that data supporting the findings of this case report is available within the article.

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