Case Report: Obstetric and COVID-19-Related Morbidity and Mortality in Three Patients with Sickle Hemoglobinopathy

Shanea Gibson,1* Tiffany Hunter,1,2 and Nadine Johnson1,2

1Department of Obstetrics and Gynaecology, University Hospital of the West Indies, Kingston, Jamaica; 2Department of Obstetrics and Gynaecology, University of the West Indies, Kingston, Jamaica

Abstract. Approximately 3% of pregnant women have sickle cell disease (SCD). COVID-19, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), became a global pandemic in March 2020, resulting in more than 3,500 deaths in Jamaica by April 2023. Sickle cell disease is an immunocompromised state; therefore, contracting COVID-19 may result in adverse maternal/neonatal outcomes. Current literature focusing on individuals of Afro-Caribbean descent is limited. Our objective was to describe the obstetric and neonatal outcomes of pregnant patients with SCD who contracted COVID-19. A retrospective case series was conducted at the University Hospital of the West Indies (Jamaica) from 2020 to 2022. We describe the maternal and neonatal outcomes of three patients with COVID-19 and SCD (including two with hemoglobin SC disease and one with hemoglobin SS disease), with complications including the demise of a mother and a newborn. Vaso-occlusive crisis was the more common presentation. Two patients required ventilatory support. Although previous reports have shown similar clinical sequelae in pregnant and nonpregnant patients with SCD and COVID-19, maternal and neonatal deaths remain possible.

INTRODUCTION

Sickle cell disease (SCD) is the most common inherited hemoglobinopathy predominantly affecting persons of African ancestry, resulting in a reduced erythrocyte life span and chronic hemolytic anemia. In the Jamaican pregnant population, 2.8% of women have SCD. This group of disorders is highly associated with increased maternal morbidity/mortality, with the most common cause of maternal death being acute chest syndrome (ACS).

COVID-19, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was officially declared a pandemic in March 2020. Patients with chronic medical illnesses are prone to severe disease/mortality. Antepartum women are more susceptible to severe pneumonia owing to the physiological changes in pregnancy, namely impaired immunity, reduced respiratory reserves, and hypercoagulability coupled with increased cardiac demand. These changes are further aggravated in SCD patients, resulting in vaso-occlusive crisis (VOC), ACS, and venous thromboembolic events.

In the era of the COVID-19 pandemic, it is immensely important to highlight the various outcomes observed with an uncommon condition in the obstetric patient. Prior case studies/series have been reported in Brazil, India, and Oman. Outcomes were generally favorable, concluding that pregnant patients with SCD and COVID-19 infection had courses similar to those of the nonpregnant SCD population. Jamaica is a low- to middle-income emerging economy with significant mortality/morbidity. Case series similar to those of the nonpregnant SCD population have been reported. This is the first report of the outcomes of COVID-19 infection in pregnant patients with SCD and highlight their obstetric outcomes. Ethical approval was obtained from the University of the West Indies–Mona Campus, Jamaica (CREC-MN.0269, 2022/2023).

CASE 1

A 29-year-old gravida 2, para 1 (G2P1) (hemoglobin SC disease [HbSC]; steady-state hemoglobin, 10.9 g/dL) had an uneventful antenatal period. At gestational age 36 weeks and 6 days, she presented complaining of lower back pain for 1 day. Vital signs revealed fever (38°C) and new-onset hypertension of 151/87 mm Hg without proteinuria or symptoms of preeclampsia. The COVID-19 polymerase chain reaction (PCR) test was positive. She received metamizole (analgesia/antipyretic) with intravenous hydration and then codein induction at gestation age 37 weeks and 6 days, with subsequent vaginal delivery 17 hours later. She was discharged 2 days postdelivery with her neonate.

CASE 2

A 31-year-old gravida 3, para 1 and 1 miscarriage (G3P1+1) (HbSC; steady-state hemoglobin, unsure) with an uneventful antenatal period presented at 37 weeks and 3 days complaining of joint pain and was assessed as having VOC. She was afibrile but tachycardic at 117 beats per minute and tachypneic at 30 breaths per minute, maintaining oxygen saturation (SpO2) of 98% on room air. Fetal tachycardia was noted and was resolved with intrauterine resuscitation. The COVID-19 PCR test was positive. Opioid analgesia was administered, and there were no abnormal respiratory findings on auscultation. The maternal vitals normalized once the patient’s pain was controlled. She was induced and delivered 16 hours later after vacuum-assisted delivery for fetal malposition. Immediately postpartum, she became febrile at 38.5°C with a respiratory rate of 18 breaths per minute and an SpO2 of 95% on 5 L/minute oxygen therapy via face mask. The neonate was admitted because of low-grade pyrexia. Antipyretics were administered, and the respiratory examination remained unremarkable. Vaso-occlusive crisis returned, and the patient became tachypneic and tachycardic 3 hours postdelivery with...
harsh breath sounds throughout. She was assessed as having COVID-19 pneumonia and ACS and administered remdesivir, dexamethasone, therapeutic unfractionated heparin, and paracetamol. Her oxygen requirements increased rapidly, which led to transfer to the intensive care unit (ICU), intubation, and ventilation. Hypotension and bradycardia were noted, and she was started on inotropes. However, cardiopulmonary arrest ensued with no return of spontaneous circulation after 40 minutes of advanced cardiopulmonary resuscitation.

CASE 3

A 23-year-old primigravida (hemoglobin SS disease [HbSS]; steady-state hemoglobin, 6 g/dL) at gestational age 28 weeks and 6 days was transferred from a rural hospital for chest pain, fever, and worsening dyspnea. Her last sickle crisis was in childhood, requiring blood transfusion. At the referral center, she was febrile at 40.5 °C and tachypneic at 40 breaths per minute with an SpO2 of 88% on room air, which improved with 5 L/minute of oxygen. She became hypotensive, requiring noradrenaline infusion, and commenced ceftriaxone, which was switched to piperacillin/tazobactam. Upon transfer, frank hematuria was noted with occasional hypoglycemic episodes. The urea was elevated at 9.2 mmol/L with a deranged coagulation profile and transaminases. Her oxygen requirements increased to 10 L/minute via face mask. She was transfused fresh-frozen plasma to correct her coagulopathy and dextrose 5% in water. She was transferred to the ICU and extubated on day 2 postoperatively. Antibiotics were changed to meropenem, and blood cultures were sterile. On day 11 postdelivery, she was assessed as having acute fatty liver in pregnancy (AFLP) and was delivered operatively. Antibiotics were changed to meropenem, and an emergency subtotal hysterectomy was performed. After an estimated blood loss of 1.15 L with hyperfusion may con...
In the era of pandemics with emerging novel microorganisms that have adverse clinical effects on humans, it is useful to report our experiences and outcomes. The effects of COVID-19 infection in pregnant women with underlying comorbidities is of particular interest. The creation of a registry may further enhance knowledge. It may also be useful to examine the effect of COVID-19 vaccination on infection incidence and severity in this population.

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Authors’ addresses: Shanea Gibson, Department of Obstetrics and Gynaecology, University Hospital of the West Indies, Kingston, Jamaica, E-mail: shaneagibson@hotmail.com. Tiffany Hunter and Nadine Johnson, Department of Obstetrics and Gynaecology, University Hospital of the West Indies, Kingston, Jamaica, and Department of Obstetrics and Gynaecology, University of the West Indies, Kingston, Jamaica, E-mails: tiffany1076@yahoo.com and nadinej@cwjamaica.com.

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