

# Sickle Cell Anemia Complicating Pregnancy in Coronavirus Disease Era: Managing Two Maladies

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## ABSTRACT

**Aim and objective:** The aim and objective of this case series is to enlighten the effect of coronavirus disease-2019 (COVID-19) infection in pregnant patients with sickle cell disease.

**Background:** The novel coronavirus or COVID-19 infection continues to challenge healthcare providers with the countless number of waves ravaging across the globe, questioning some of the intransigent beliefs regarding behavior of viruses. COVID-19 creates a milieu of thrombotic state which is of particular importance in cases who are already at risk like those with sickle cell disease especially that in a pregnant population. Thus, we share here three case reports of sickle cell disease patients who came out COVID-positive during pregnancy.

**Case description:** We discuss three cases of pregnant patients with history of sickle cell disease who were COVID-19-positive and were treated on an in-patient basis. All of them presented with symptoms of crisis, but all three cases responded well to therapy and were subsequently discharged in a stable condition.

**Conclusion:** Our experience with these three cases was that all of them presented with symptoms of crisis, however, were these caused by the presence of the coexisting COVID-19 infection is a subject to further research.

**Clinical significance:** In the era of pandemic, especially in case of a new contagion, it is of immense importance to document and share as much as possible regarding the behavior of the virus in patients with different comorbid conditions. While there are much literature available of the clinical picture of COVID-19 in case of the more common comorbidities like diabetes mellitus and hypertension, there is a significant lack in availability of proper literary guidance in case of some rarer but significant conditions like hemoglobinopathies. We hope our case series creates a paradigm for future research on the role of COVID-19 in more uncommon comorbidities.

**Keywords:** Coronavirus, Coronavirus disease-2019, Gestational, Pregnancy, Sickle cell anemia, Sickle cell disease.

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## BACKGROUND

Sickle cell disease is of the most commonly inherited hematological disorders known to complicate pregnancies. The prevalence of the disease can vary from 1 to 44% in the tribal populations of India.<sup>1</sup>

The novel coronavirus SARS-CoV-2 infection may lead to severe respiratory distress in some patients. Coronavirus disease-2019 (COVID-19) infection renders the body's milieu to be profoundly thrombotic. There has been no evidence in current literature linking the two diseases in a pregnant patient. Our manuscript would create a paradigm for future research on the role of COVID-19 in more uncommon comorbidities like hemoglobinopathies.

## CASE DESCRIPTIONS

### Case 1

Mrs. JM, 20-year-old lady, a G2 P1 L1 at 31 weeks 4 days, was referred from a rural COVID care center to our COVID hospital with fever, joint pain, malaise, and difficulty in breathing for 1 day. She was married for 4 years, previous vaginal delivery 3 years back. She had a history of sickle cell disease, which was diagnosed in her childhood but no history of flare or crisis during previous pregnancy. She belonged to a poor socioeconomic background and was neither on folic acid tablets nor iron supplements. She received 1 unit of PRBC from the referring center. On examination, patient was irritable and restless; her SpO<sub>2</sub> was 88% on room air which was improved on administering high flow oxygen inhalation. P/A Uterus was 32 weeks, relaxed, FHR—130/minute, regular. P/V: Cervix—~3 cm long, OS

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closed. After admission, she was started on routine medications along with oxygen inhalation, analgesics, and IV fluids. Her initial blood exams were as follows: hemoglobin, 6 g/dL; hematocrit, 28.2%; WBC,  $37.1 \times 10^9/L$ ; platelets,  $113 \times 10^9/L$ ; reactive C-protein, 100 mg/L; total bilirubin, 2.23 mg/dL; lactate dehydrogenase, 1000 U/L; D-dimer, 4620 mg/mL; and ferritin, 1000 U/L. On 3rd day, FHR was nonrecordable and on USG cardiac activity of fetus was not seen. Induction was planned, and on the following day, she delivered a dead male fetus with no visible deformity. Her blood investigations consequently showed a decreasing trend in parameters. Both her COVID-19 and sickle cell crisis-related symptoms were relieved, and the patient was discharged on post expulsion day 6 in a stable hemodynamic condition.

## CASE 2

Mrs. RN, 25-year-old lady, G3 P2 L2 at 39 weeks 2 days gestation with COVID-19-positive status, admitted with c/o body ache and joint pain for 1 day. She had been married for 4 years with two previous vaginal deliveries. She was a known case of sickle cell disease diagnosed 1 year back. There was an episode of vaso-occlusive crisis 3 months back and had received 1 unit of PRBC at that time. On examination, her vital parameters were stable with SpO<sub>2</sub> maintained at 97% in room air and RR was 18/minute. P/A—uterus was term sized, relaxed, FHR—146/minute, regular. P/V—cervix was short, soft, posterior, OS was parous. She was started on inhalational oxygen at 4 L/minute and IV fluids and analgesics were given. Her initial blood parameters were as follows: hemoglobin, 7 g/dL; hematocrit, 24.2%; WBC, 13.5 × 10<sup>9</sup>/L; platelets, 152 × 10<sup>9</sup>/L; C-reactive protein, 100 mg/L; total bilirubin, 21.21 mg/dL; lactate dehydrogenase, 569 U/L; D-dimer, 4.5 µg/mL; and ferritin, 321 U/L. She went into spontaneous labor the following day. She delivered a healthy 3.02 kg male baby vaginally. Joint pain was present during labor and delivery but no other complications were there. She also developed superficial cellulitis of right leg which was resolved in 4 days by conservative measures. By PND-2, her joint pains had subsided, and she was discharged on PND-10 in a stable hemodynamic condition.

## CASE 3

Mrs. PD, 29-year-old woman, primigravida at 38 weeks 4 days of gestation with asymptomatic COVID-19-positive status referred from a non-COVID hospital setup where she had been planned for an elective LSCS. She had no complains during admission. She was a k/c/o sickle cell disease since childhood and also a k/c/o hypothyroidism diagnosed during pregnancy and was on medication. She underwent hip replacements in 2010 and 2017. On examination, her vitals were stable, SpO<sub>2</sub> 96% in room air and RR—16/minute. P/A—uterus term size, relaxed, FHR 134/minute, regular. She was started on routine medications and upon request was planned for elective LSCS the following day. Her initial blood exams were as follows: hemoglobin, 9 g/dL; hematocrit, 36.2%; WBC, 17.8 × 10<sup>9</sup>/L; platelets, 1,99,000/mL; C-reactive protein, 100 mg/L; total bilirubin, 1.76 mg/dL; lactate dehydrogenase, 397 U/L; D-dimer, 2.5 µg/mL; and ferritin, 235 ng/mL. Patient started complaining of pain in both legs on the morning of surgery which was relieved upon administering IV fluids, O<sub>2</sub> inhalation, and injectable analgesics. Leg pain subsided on POD-2. Her post-op period at the hospital was uneventful. She was discharged after proper stitch removal on POD-8 in a stable hemodynamic condition.

## DISCUSSION

The physiological changes of pregnancy like increased metabolic demand, increased blood viscosity, and hypercoagulability get aggravated in SCD patients leading to increased incidence of

complications like a vaso-occlusive crisis, acute chest syndrome, thromboembolic events etc.<sup>2</sup> Crisis can be triggered by bacterial infection and rarely by viral infection. In the last decade, during the previous epidemics of SARS and H1N1, extensive or thorough studies regarding the precipitation of sickle cell crisis due to the infection are a few. Due to its short history, studies on COVID-19 are scanty. A few case reports implied that the symptoms could be only respiratory or even nonspecific, presenting with only vaso-occlusive crisis.

A recent review of SARS-CoV-19 in pregnant women showed some cases of severe maternal morbidity and perinatal deaths although the majority of the cases had a good outcome.<sup>3</sup> Our experience with these three cases was that all three of them presented with symptoms of crisis, however, were these caused by the presence of the coexisting COVID-19 infection is a subject to further research. But the fact that all three had a good maternal outcome corroborates with a paper by Hussain et al. that anemia, hemolysis and chronic inflammation, physiopathological characteristics of SCD, might have a favorable influence in the clinical course of COVID-19 infection in these patients.<sup>4</sup>

## CLINICAL SIGNIFICANCE

In the era of pandemic, especially in case of a new contagion, it is of immense importance to document and share as much as possible regarding the behavior of the virus in patients with different comorbid conditions. While there are much literature available of the clinical picture of COVID-19 in case of the more common comorbidities like diabetes mellitus and hypertension, there is a significant lack in availability of proper literary guidance in case of some rarer but significant conditions like hemoglobinopathies. We hope our case series creates a paradigm for future research on the role of COVID-19 in more uncommon comorbidities.

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