Severe Pre-Eclampsia in the Setting of COVID-19 Case Report of Three Patients in Detroit, Michigan

Amneet Sran
Tra V. Pham
Quoc V. Le

Follow this and additional works at: https://scholarlycommons.henryford.com/merf2020caserpt
**Case 1. Severe Pre-eclampsia**

An 18 year old gravida 1 female presented at 36 weeks 5 days with worsening dyspnea, cough, subjective fever, and persistent headache. She previously presented at 35 weeks with respiratory symptoms, tested for COVID-19 and discharged home with standard COVID precautions. Her COVID-19 swab resulted positive two days later and she was notified. Upon re-presentation, she complained of worsening respiratory symptoms, unresolving headache despite acetaminophen, and right upper quadrant pain for one week. Her heart rate was 122 beats/min, respiratory rate 22 beats/min, temperature 37°C, blood pressure 178/128 mmHg. Over a short course, her oxygen saturation (SpO2) dropped to 92%, and she required oxygen supplementation with nasal cannula (NC). Pre-eclampsia labs were significant for elevated LDI and protein/creatinine ratio (12.9). She received multiple antihypertensives to correct elevated blood pressures, intravenous (IV) magnesium sulfate for seizure prophylaxis, and betamethasone for fetal lung maturity. Chest radiography demonstrated diffuse foci consolidation, patchy airspace opacities, and initial prominence consistent with COVID-19 pneumonia. Fenital monitoring demonstrated category two fetal heart tracing. She was admitted to labor and delivery (L&D) for induction of labor (IOL) for severe pre-eclampsia. On L&D, her oxygen requirement increased to 6 liters saturating 92% with a respiratory rate of 44-50 breaths/minute during the induction process and decision was made to proceed with cesarean delivery for worsening maternal status. Patient received neuraxial anesthesia and delivery was uneventful. Postoperatively, she was started on oral prednisone; however, hydroxychloroquine was held for 2-weeks pending QTC interval. Her oxygen requirement increased to 8 liters saturating 90-92%. She was placed on 10L non-rebreather mask and transferred to the intensive care unit (ICU). Her oxygen requirement was escalated to high-flow NC, and she was intubated on post-operative day (POD)#0. She received 24 hours of postpartum magnesium sulfate for seizure prophylaxis and started on nifedipine for persistent hypertension. Tracheal aspiration was negative for COVID-19. Ceftriaxone and doxycycline were initiated due to concerns for concomitant community-acquired pneumonia. She was extubated on POD#3 and was weaned from air on POD#4. She was transferred to the postpartum unit on POD#5. Neonatal course was uncomplicated and COVID testing was negative.

**Case 2. Severe Pre-eclampsia**

A 35 year old gravida 5 para 5 (history of twins) at 36 weeks and 4 days gestation presented to L&D with worsening pelvic pain for one day. She denied shortness of breath, fever, chills, and gastrointestinal symptoms; however, reported a chronic cough during this pregnancy. She worked in a nursing home, but stated no colleagues tested positive. She denied sick contacts. She was febrile at 39.2°C, tachycardic at 140 beats/min, and hypertensive (150/90mmHg). Her respiratory rate was 20 breaths/min, SpO2 99%, and placed on oxygen supplementation. Fetal tachycardia (180-200 beats per minute) was noted on a non-stress test. On examination, the patient had diminished breath sounds on the right lung. Chest radiography demonstrated a central pulmonary infiltrative process consistent with pneumonia. COVID-19 and influenza nasopharyngeal swabs were obtained. Laboratory results were remarkable for elevated AST and LDH, lymphopenia, and proteinuria, meeting diagnostic criteria for preeclampsia in the setting of severe pneumonia. She underwent an uncomplicated vacuum-assisted vaginal delivery.

Supportive care and antibiotics were initiated for suspected pneumonia while COVID results were pending. On hospital day 2, IOL was recommended due to persistent 2 fetal heart tracing. Betamethasone was administered for fetal lung maturity; COVID-19 test resulted positive 19 hours after collection, and she was started on oral hydroxychloroquine and IV methylprednisolone. That evening, her respiratory status continued to worsen requiring 8L O2 NC. Blood pressures at this time were severe enough to require immediate release anti-hypertensive medication. Intravenous magnesium sulfate was initiated for seizure prophylaxis, in the setting of severe preeclampsia. She underwent an uncomplicated vacuum-assisted vaginal delivery.

Magnesium sulfate was continued for 24 hours postpartum. Patient continued to worsen off oxygen supplementation and was on room air by postpartum day (PPD)#2. Patient was discharged home on POD## in stable condition.

Neonatal course was complicated by respiratory distress. Angras were 8 at one and five minutes of age. Infant became tachypneic, tachycardic and cyanotic at two minutes of life, requiring intubation for airway protection. Chest radiography revealed a large right sided pleural effusion on POD## and infant was transferred to the NICU on nasal cannula at 2.5 minutes at FIO2 21.28%. Infant was started on ampicillin and gentamicin for sepsis prophylaxis. COVID-19 swabs were obtained on day of life 2 and 3 at 24 hours and were both negative. On day 3 of life, the infant was weaned to room air, antibiotics discontinued, and discharged home.

**Case 3. Atypical HELLP Syndrome**

A 35 year old gravida 8 para 7 (history of twins) female with six prior cesarean deliveries was admitted at 36 weeks gestation for concern of preterm labor. She also reported feeling unwell with associated abdominal pain, subjective fever, and body aches. She denied cough, shortness of breath, gastrointestinal symptoms, or sick contacts. On presentation, she was febrile to 38.3°C, blood pressure was 135/71 mmHg, heart rate 99 beats/min, and respiratory rate 22 breaths/min. Fetal monitoring was normal. She was admitted for amniocentesis of COVID-19 testing and started on antibiotics. Chest radiography revealed no infiltrates. Computed tomography scan was negative for pulmonary embolism, but showed concern for multifocal pneumonia. She was started on a five day course of hydroxychloroquine. On POD##, she was weaned off oxygen and saturating well on room air. The AST increased from 37 to 76 IU/L, but remained stable during the remainder of her hospital course. She was discharged on POD## in stable condition. Neonatal course was uncomplicated and COVID testing was negative.

**Discussion**

- Magnesium sulfate reduces the risk of developing eclamptic seizures in the peripartum period. [8-9]
- In the setting of COVID-19 viral pneumonia, treatment with magnesium sulfate may worsen respiratory status and potentially increase the patient’s need for oxygen requirements or mechanical ventilation.
- It is important to follow strict diagnostic criteria for severe preeclampsia, as risks for worsening respiratory status in patients with COVID-19 can be prevented if they do not require magnesium sulfate therapy
- Due to frequent capillary leak and decreased colloid oncotic pressure in preeclampsia, excessive resuscitation may lead to elevation of pulmonary capillary wedge pressure and increase risk of pulmonary edema
- Avoiding excessive fluid resuscitation in COVID-19 is important to minimize risk of respiratory distress and help shorten duration of ventilation. [9-11]
- Recent meta-analysis of a combination of subtypes of coronavirus demonstrated an increase risk for preterm birth, miscarriage, preeclampsia, cesarean birth, and perinatal death. [12]
- A sub-analysis demonstrated only 1 of 12 patients with COVID-19 (13.5% [95% CI 1.2-36.0]) had coexisting preeclampsia.
- With the patients in our study, our presumption is that the diagnosis of severe preeclampsia is superimposed upon the diagnosis of COVID-19, and could be one of several risk factors placing the PUI at higher risk of COVID-19 complications.
- As more studies regarding COVID-19 infection emerge, we would be able to obtain more answers on its impact on pregnancy.
- In addition, larger studies are needed to explore new guidelines on preeclampsia diagnosis and management in patients testing positive for COVID-19.

**References**