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Case Report

Severe acute respiratory distress syndrome in COVID-19 infected pregnancy: a case report

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ABSTRACT

Corona virus 2019 is an emerging disease with a rapid increase in cases and deaths. Limited data is available about its progress and consequences in pregnancy. We present clinical challenges and potential strategies for optimal maternal fetal surveillance by a case report on how we successfully managed a COVID -19 infected elderly primigravida with twin gestation and severe acute respiratory distress syndrome.

Keywords: COVID-19, Maternal fetal surveillance, Chest CT, Mechanical ventilation

INTRODUCTION

The beta corona viruses are single stranded, non-segmented, enveloped RNA viruses which usually cause illness ranging in severity from common cold to severe respiratory illness and death.¹ Data suggest incubation period ranging from 2-14 days and average of 5 days. Other manifestations are fever, sore throat, drycough, myalgia, headache, dyspnea, conjunctivitis, diarrhoea, loss of taste and smell, a rash on skin, or discolouration of fingers or toes. It is transmitted by close person to person contact, droplets and perhaps also surface contact contamination and through aerosol generating procedures-endotracheal intubation, manual ventilation before intubation, open suctioning etc. In some cases, feco oral transmission also is reported.² (Ahmed et al, Grassia et al, Wen et al).

CASE REPORT

Mrs. X, an elderly primigravida (48 yrs) at 28 weeks gestation/dichorionicdiamniotic twin gestation (DCDA)/intra cytoplasmic sperm injection (ICSI) pregnancy/gestational diabetes mellitus (GDM) on insulin/

gestational hypertension/hypothyroid with prophylactic cervical encirclage. Cervical encirclage was done at 13 weeks prophylactically in view of precious pregnancy, ICSI and twin gestation. She came to emergency with severe breathlessness and admitted on 2nd June 2020 as she was diagnosed COVID positive with breathlessness for the past 2 days. No history of cough, sick contact or recent travel. She presented with complaints of severe breathlessness, inability to lie in supine position. She was tachypnoeic, afebrile and hypoxic (temperature- 98.6 F, respiratory rate; 30/min, SpO₂- 88% at room air, Pulse rate- 88/min, blood pressure- 110/60 mmHg) requiring 3 liters of oxygen via nasal prongs. She was admitted to COVID isolation ward. She had bilateral lung crepitations Basic investigations like blood works were notable for anemia, leukocytosis with relative lymphopenia, and mild thrombocytosis. (Haemoglobin- 10.4 mg/dl, WBC count 21,000/mm³ with 5% of lymphocytes, platelet count -4,98,000/mm³) chest X ray with double lead shield done revealing heterogenous opacities in bilateral middle and lower zones (Figure 1). ECG and ECHO done, which were normal. She was started on LMWH (Clexane 0.4 ml s/c od, antivirals lopinavir/ritonavir, IV steroids and IV Inj. Meropenem 1

gm tds. Inflammatory markers were serially monitored as shown below. Rest of the biomarkers; obstetric ultrasound and doppler were normal. She was monitored with CTG and urine albumin twice a day.



Figure 1: Chest X-Ray.

Her arterial blood gas analysis showed high anion gap metabolic acidosis and elevated serum ketone levels. Adequate IV hydration and IV insulin infusion were started. She was managed by high flow nasal canula (HFNC) and noninvasive ventilation initially. Antibiotics were escalated to POLY B 7.5 lakhs IU and Tigecycline 150 mg IV bd. On day 5 of symptom onset, she was intubated and started on volume control mechanical ventilation in view of worsening hypoxia and increased work of breathing. High vaginal swab cultures grew *Candida auris* and she had fluctuating haemodynamics, started her on Caspofungin 50 mg IV od. The CTG was none reassuring with decreased variability indicating fetal distress-so a multi-disciplinary panel discussion between the obstetrician, internist and intensivist was conducted and a decision to terminate pregnancy was taken. This decision was taken taking into consideration both mother and babies. The mother could be given the best care if the babies would be delivered and could be life saving for the mother. It was an IVF pregnancy, very precious indeed. Detailed counselling regarding severity of pneumonia, imminent kidney failure, high mortality risk, need for prolonged ICU stay for the mother and NICU stay for preterm babies was explained and proceeded with Emergency LSCS on 6.6.2020 after the intubation.

She delivered twin girls of weights-1.3 kg and another 630 gms by LSCS. Apgar score at 1 min was 7 and 5 for twin 1 and twin 2 respectively. Both of them were intubated and then shifted to NICU for ventilator support in view of extreme prematurity and for further management. Both the babies were tested negative for COVID-19. Circlage stitch was removed. During hospital stay, the mother had 2 episodes of sepsis with multiple secondary bacterial infections for which she was treated. New onset *Burkholderia cepacia* seen on blood cultures and bacteremia seen with urine culture showing MDR

klebsiella – and this was managed with antibiotics like meropenem, tigecycline, poly B, ceftazidime. She required ionotrope support along with prolonged mechanical ventilation. She underwent tracheostomy on day 20 to facilitate prolonged ventilator support.

Repeat CT scan chest was suggestive of COVID related changes fibrotic bands in both lungs, diffuse ground glass opacities, interlobar septal thickening nodular lesions, small patch sub pleural consolidation in both lower lobes (Figure 2).



Figure 2: Chest CT scan.

She had left foot drop –L5-S1 showing radiculopathy which was treated symptomatically.

She eventually recovered with steroids and other supportive measures, her oxygenation improved and tracheostomy closure done on 35th day. She was kept on dexamethasone after tracheostomy closure. Mother was discharged on 45th day of ICU stay with a plan to continue oral steroids and taper over the next few weeks. At the time of discharge –first twin was 1.9 kg; second twin was 1.5 kg both were able to feed well. The first twin was discharged on 46th day of NICU stay. The second twin was discharged on around 66th day of NICU stay. Mother and both the babies have been discharged and are doing well.

DISCUSSION

The physiological changes in pregnancy makes women more vulnerable to COVID-19 infection and causes rapid deterioration in the condition.³ NAT -Nucleic acid amplification technique is the gold standard for diagnosing viral pneumonia caused by SARS COV-2 infection. Real time reverse transcriptase PCR is used for NAT. Specimens can be obtained through upper respiratory tract (oronasopharynx), lower respiratory tract (bronchial extracts, trachea, alveolar lavage/lung tissue biopsy).

Diagnosis

Biochemical indicators of prognosis

RT-PCR (real time reverse transcription polymerase chain reaction) is used for NAT.

Patients with SARS-COV 2 infection may develop hypoxemia which may not have any apparent symptoms and depending on the severity of the illness they may develop, multiple organ dysfunction with micro emboli.

Elevated procalcitonin has a great significance for clinical diagnosis of sepsis. In case of elevated ALT; AST, LDH, Phosphocreatine kinase and myoglobin it indicates patient suffering from multiple organ dysfunction. Elevated troponin and those with lower absolute lymphocyte count indicate poor prognosis. Elevated NLR number-Neutrophil to Lymphocyte ratio is an independent risk factor affecting the occurrence of severe illness.⁴

Serial monitoring of CRP, with level above 100, IL-6; IL 10, and CD8+T lymphocyte levels and NLR can help assess risk of worsening condition of Covid-19 patients.⁵

Imaging

Chest X ray

Ground glass (GGO) pattern is the most common finding in COVID -19 infections. It may start as unifocal lesion mostly in the inferior lobe of right lung but may present as multifocal, bilateral and peripheral lesions in later stages of the disease.⁶

CT-chest

CT with high resolution to lungs is preferred. Mostly bilateral multiple lesions are observed; usually at the periphery of lungs, under pleura, lower lungs. They could be small patches/large ground glass opacities, irregular fan shaped/flaky. Crazy paving- defined as presence of thickened interlobular and intralobular lines in combination with a ground glass pattern. In advanced cases, there could be bronchial vascular thickening /sub pleural bands. Another common finding in the areas of ground glass is traction bronchiectasis. The easiest way to score the severity is by visual assessment. Pleural effusion, pericardial effusion, lymphadenopathy, cavitation, CT halo sign and pneumothorax are possible findings seen with disease progression.

Ultrasound

It is mostly focused on heart and lungs for COVID-19 patients, severe patients present with multiple organ failure. It is used to rule out the presence of deep venous thrombosis and arterial embolism in peripheral vessels of extremities. COVID inflammation tends to cause

microemboli. Progressive increase in D dimer is an early warning sign of disease aggravation and DIC occurrence. Therefore, patients are prone to DVT and PE, so as a routine practice anticoagulant are started.

So therapeutic anti coagulation was started in our patient. Laboratory parameters may show progressive increase in D-dimer value which is an early warning sign of the onset of the procoagulant DIC. 30% show shortened PT/APTT value. They might show normal/slightly increased platelet count. Fibrinogen could be increased in COVID patients which decreases in later stages of disease in patients with DIC with consumptive hypocoagulability.⁷⁻¹¹

Obstetric management in COVID-19 patients with lung symptoms

Decisions about the use of steroids for fetal lung maturity in preterm cases should be made in consultation with Infectious department and materno- fetal medicine specialists. At the time of admission due to COVID pneumonitis, our patient was already started on IV steroids. It was advised that 2 different steroids cannot be given to the same patient and it would have anyways served the purpose of lung maturity.

Individualised decisions regarding delivery should be considered based on gestational age of the fetus and should be made in conjunction with neonatologist.¹² Decision regarding Magnesium sulphate administration for fetal neuro protection before 32 weeks gestation has to proceed as per standard indications. This provides an additional benefit of bronchodilation in the setting of bronchospasm after intubation. In our case, it was an emergency due to fetal distress; we didn't have enough time to start the Magnesium sulphate infusion. Furthermore, our patient was already in respiratory failure-it would have further caused respiratory depression.

Restriction of IV fluids to 125 ml/hour is done. Delayed cord clamping and immediate skin to skin maternal contact should be avoided. Consistent with previous studies, clinical symptoms from 33 neonates with or at risk of COVID-19 were mild and outcomes were favourable.¹³⁻¹⁵ No evidence for vertical transmission so far noted in late pregnancies.¹⁶

According to a study on 116 COVID-19 cases in pregnancy-12.5% had spontaneous abortion,6.1% had preterm birth.¹⁷ There is no evidence of transmission through breast feeding in the literature so far, however it should be done taking precautions as proper hand hygiene and wearing a mask while handling the baby.

Emerging evidence suggests that anti-viral agents like Remdesivir may be effective against SARS-COV-2, but Oseltamivir -neuraminidase inhibitors have no proven benefit.^{18,19} Continuous positive airway pressure are not

recommended for managing acute hypoxemic respiratory failure due to their increased chances for urgent transition to invasive ventilation.²⁰ Rapid sequence endotracheal intubation should be performed as per routine with consideration of smaller size of tube due to edematous and narrowed airway in pregnant patients. Prone ventilation is found significantly improve oxygenation in ARDS, its feasibility and safety in pregnancy have been documented.^{21,22} In cases where mechanical ventilators might not be sufficient to support adequate oxygenation - ECMO (extra corporeal membrane oxygenation) maybe tried.

CONCLUSION

Principles of management include early isolation, aggressive infection control procedures, O₂ therapy, avoidance of fluid overload, empirical antibiotics, lab testing for virus and coinfection, fetal monitoring, early mechanical ventilation for progressive respiratory failure, individualized delivery planning, team multidisciplinary approach.

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