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CASE REPORT **ANESTHESIA & CONCURRENT DISEASE**

Perioperative anesthesia management of a pregnant patient with COVID-19 and Guillain-Barre syndrome undergoing emergency cesarean section – a case report

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Abstract

The presence of Corona virus disease of 2019 (COVID-19 and Guillain-Barre syndrome (GBS) in a pregnant patient presents a unique challenge to the anesthesiologist. The decision for anesthesia technique in this case depends upon the specific features of both diseases. We present a case of successful anesthesia management of a pregnant patient with COVID-19 and GBS undergoing emergency cesarean section.

Key words: SARS-CoV-2; Guillain-Barre syndrome; Anesthesia

Abbreviations: GBS – Guillain-Barre syndrome; OR – Operating room; CTG – Cardiotocography; HFNO – High flow nasal oxygen; TOF – Train of four

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1. Introduction

The world is currently facing one of the worst pandemics in history caused by severe acute respiratory syndrome caused by corona virus 2 (SARS-CoV-2).[1] The disease presentation ranges from mild symptoms including dry cough, fever to severe pneumonia leading to respiratory failure, sepsis and death.[2] Uncini et al in their systematic review reported 42 patients with SARS-CoV-2 and Guillain-Barre syndrome (GBS) mostly from Europe during the first 6 months of the pandemic, suggesting a possible association. Based on the interval between the onset of COVID-19 and of GBS symptoms, both parainfectious and post–infectious GBS cases have been reported.[3] GBS is an acute inflammatory demyelinating polyneuropathy and it shows heterogeneous presentations in COVID-19 patients, both clinically as ascending or cranial nerve paralysis and electrophysiologically as an axonal or demyelinating disease.[3] We did not find any case report in the scientific literature about anesthesia management of COVID-19 patient with GBS.

We present this case report of a pregnant patient with COVID-19 and GBS who underwent emergency cesarean section to document it for the consideration by anesthesiologists.

2. Case report

A 32-years old lady was booked in operating room (OR) for emergency cesarean section due to placenta

previa with abnormal cardiotocography (CTG). The patient was gravida 4, para 2 and 31 weeks pregnant. She was a known case of asthma, protein C and protein S deficiency. She was diagnosed with SARS-CoV-2 about 6 weeks back and required hospital admission for 3 weeks. During admission, she stayed in the intensive care unit for 10 days and required high flow nasal oxygen (HFNO). She was kept on a therapeutic dose of subcutaneous inj. enoxaparin (Clexane®) 80 mg twice a day. Later she was discharged home. Two weeks after discharge, she was admitted again because of ascending limb muscle weakness. She was diagnosed to be suffering from GBS and was admitted to the intensive care unit. She was put on intravenous immunoglobulin.

She was seen by the obstetrician and placenta previa was diagnosed. She was kept under observation with continuous CTG. Thirty six hours after ICU admission, her CTG became abnormal and emergency cesarean section was planned. Preoperatively, her vital signs included heart rate 100 beats/min, blood pressure 120/70 mmHg, respiratory rate 22/min and SpO_2 at 97% on room air. She appeared pale and lethargic. She was well oriented but had muscle power 3/5 in both upper and lower limbs. There was no sign of respiratory distress. Laboratory investigations revealed severe anemia (hemoglobin 7.6 g/dl) and severe hypokalemia (serum potassium 2.7 mmol/L). High-risk consent was taken from the patient considering her medical conditions. Her last COVID-19 swab was positive 15 days back, so she was managed in OR as Covid positive. An immediate preparation was done for Covid case as per the hospital policy. All healthcare personnel used full personal protective equipment (PPE). Because of the nature of the emergency and patient being on anticoagulation (Clexane® 80 mg twice a day), it was decided to go for general anesthesia (GA) for this case.

On arrival to OR, the patient was connected to ASA recommended monitors including ECG, blood pressure, SpO_2 and $EtCO_2$. She was preoxygenated with 100 % oxygen. Rapid sequence induction with cricoid pressure was done. We used propofol 100 mg IV and Rocuronium 100 mg IV followed by intubation with size 7.0 endotracheal tube using C-MAC® video laryngoscope. An arterial line was maintained to monitor beat to beat blood pressure. Anesthesia was maintained with sevoflurane 1% along with oxygen/nitrous oxide mixture in a ratio of 40:60 at fresh gas flow (2 L/min). Fentanyl 100 µg IV and syntocinon 10 units were administered after delivery of the baby. Regular neuromuscular monitoring with train of four (TOF) was used. The whole operation lasted for about 2 h with an estimated blood loss of 1000 ml. Phenylephrine infusion was used prophylactically at a rate of 30-100 µg/min titrated to target MAP between 65–70 mmHg. The patient was administered one liter of crystalloids and 3 units of packed red blood cells intraoperatively. A total of 40 mmol of potassium chloride was given intravenously over one hour starting just after induction. Forced air warming mattress was used to maintain normothermia intraoperatively.

At the end of surgery, the patient was assessed for postoperative plan. Her heart rate was 109 beats/min, mean blood pressure was in the range between 65-75 mmHg and SpO_2 was 96-98 % on 50 % FiO_2. Considering her medical conditions and significant hypokalemia (serum potassium 2.9 mmol/L) along with mild metabolic acidosis (pH 7.25), it was decided to keep her intubated and ventilated postoperatively in ICU. She needed aggressive electrolyte replacement for hypokalemia and hypomagnesemia in ICU. She remained hemodynamically stable with minimal oxygen requirement and minimal ventilatory support. Her arterial blood gas (ABG) status in the ICU was as follows; PH-7.31, PO_2-169, PCO_2-35 and HCO_3-19.[9] She was extubated on the next day. Her potassium level became normal (3.5 mmol/L) and her muscle power continued to improve over a couple of days. She was later shifted to the ward and had to be seen by the psychiatric team for depression. The rest of the course of her stay at the hospital remained uneventful and she was discharged home.

3. Discussion

Respiratory complications occur more frequently in GBS related to COVID-19. This happens because of the coexistence of COVID-19 interstitial pneumonia and GBS respiratory muscle weakness. Therefore, there is a possibility that either condition could be overlooked culminating in inadequate patient management or potential poor outcome.[4]

Our patient had multiple anesthetic considerations including emergency surgery, pregnancy, COVID-19,

electrolyte imbalance, and GBS. Scientific literature described the safety of regional anesthesia in pregnant patients undergoing cesarean section.[5] Neuraxial block techniques are usually advised during delivery of COVID-19 patients as well, whether by vaginal route or cesarean section, as these techniques will reduce cardiopulmonary compromise induced by the stress of the labour. Use of spinal anesthesia would also avoid all the risks associated with GA in pregnant patients.[6]

As long as GBS is concerned, there is no consensus in literature over the choice of anesthesia technique in the pregnant GBS patient.[7] Historically, there has always been a concern regarding the use of the regional anesthesia in patients with neurological diseases because of the risk of worsening of the disease or development of a new neurological deficit perioperatively.[8] Although epidural anesthesia or spinal, both have been used uneventfully in pregnant GBS patients,[7] there are important considerations regarding the possibility of profound autonomic dysfunction in these patients with factors like laryngoscopy, use of the inhalational anesthetics, positive pressure ventilation, position change and blood loss etc.[9] We, therefore, placed an arterial line for continuous blood pressure monitoring during the surgery.

We considered all these concerns of GA vs regional in our pregnant patient with GBS and COVID-19. But because of emergency nature of surgery and use of therapeutic dose of Clexane, we opted for GA. Endotracheal intubation and extubation are high-risk aerosol-generating procedure in COVID-19 patients and therefore all theatre personnel should use full PPE.[10] We used negative pressure OR and everyone in the OR wore PPE as per our hospital policy.

GBS patients have an up-regulation of extra-junctional muscle nicotinic receptors and therefore, succinylcholine should be avoided.[11] We used inj. Rocuronium for rapid sequence induction in our case. It is advisable to use careful monitoring of neuromuscular blockade when non-depolarizing muscle relaxant is used,[11] and hence we used train of four (TOF) monitoring. The use of indirect acting sympathomimetic agents like ephedrine is unpredictable in GBS patients,[9] hence we used phenylephrine infusion titrated according to the response.

4. Conclusion

In clinical practice of anesthesiology an increasing number of cases with COVID-19 and GBS is being reported. This case report highlights the important points considering anesthesia principles and management of a pregnant patient suffering from both GBS and COVID-19 simultaneously.

5. Acknowledgements

None

6. Authors' contribution

AUH: Concept, literature search, primary anesthesiologist, data collection, manuscript writing and editing, final manuscript approval

AMS: Literature search, data collection, manuscript writing and editing, final manuscript approval

7. Conflict of Interest

None to declare

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