

Anaesthetic Management of Patients with COVID-19: A Single Center Initial Experience from Nepal

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ABSTRACT

Anaesthetic management of patients with Corona Virus Disease (COVID-19) poses multiple challenges. In the low-income nation like Nepal, factors like suboptimal infrastructure and resource limitations may add on to the existing challenges. Proper planning and preparedness can help to overcome the challenges and enhance safety of both the patients undergoing surgery and of the health care workers involved in patient management.

Keywords: Anaesthetic management; COVID-19; Nepal

INTRODUCTION

The global pandemic of Corona Virus Disease (COVID-19) has spread globally. As of June 16, 2020, close to 8,000,000 confirmed cases are documented globally with over 400,000 deaths.¹ Nepal has seen a recent case surge with progressive rise in number of cases. Till date, 6511 confirmed cases and 19 mortalities due to COVID-19 are documented.² Parallel to the increase in number of patients with COVID-19, we can expect the increase in patients with COVID-19 requiring anaesthetic management for surgery. Here we mention our initial experiences and the challenges we faced while performing anaesthetic management of three patients with COVID-19 undergoing surgery.

CASE REPORT

All the three patients who underwent surgery were diagnosed with COVID-19 with RT-PCR testing. The first case had recent history of travel from India, one week before. Other two cases had no travel history. For all the cases, RT-PCR was performed in other centers and were referred to our center after the test report was positive. None of the patients had respiratory symptoms, all the surgeries were performed under subarachnoid block and was uneventful (Table 1).

DISCUSSION

Our institution had activated hospital incident command system in a timely fashion and had formulated three

levels of incident action plans depending upon the case surge and stages of outbreak of COVID-19. The hospital is currently functioning at Plan B (separate isolation block with dedicated isolation beds and ICU beds with ventilators for COVID positive cases). Before surgery, an operating room was designated for patients with COVID-19. Floor and movement plans were formulated for operating room. For better preparedness, hospital had developed protocols and trained the health care workers about infection prevention and control, well in advance.³ Specific training classes were conducted on donning and doffing of PPE, hand hygiene as well as about arrangements/orientation of COVID facilities to all the staffs of hospital which was conducted by trained experts. Before conducting these cases, multiple emergency surgeries were performed in suspected cases of COVID-19 (with RT-PCR reports awaited), practicing all the necessary precautions, which served as the practice drills for these cases.

Before surgery, the team members involving the surgeons, anaesthesiologists and nurses gathered for discussion to ensure smooth conduct of surgery and anaesthesia also backup plans to deal with possible complications. To gather detail patient information and to minimize contact with the patient, history, examination findings and laboratory findings were followed using telephone, from the COVID ICU or ward.

All the surgeries were planned under spinal anaesthesia, however, the necessary drugs and equipments, including

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Table 1. Summary of cases: S. No. Diagnosis Surgery performed Age Testing done Respiratory symptoms Anaesthesia provided Perioperative course

S. No.	Surgery performed	Age (yrs)	Testing done	Respiratory symptoms	Anaesthesia provided	Perioperative outcome
1	External fixation of fractured long bones of lower limbs	58	RT-PCR	None	Subarachnoid block	Uneventful
2	Caesarean section for cephalo-pelvic disproportion	29	RT-PCR	None	Subarachnoid block	Uneventful
3	Caesarean section for Intrauterine Growth Retardation	21	RT-PCR	None	Subarachnoid block	Uneventful

aerosol box, were kept ready, in the event, conversion to general anaesthesia would be necessary. Two individuals from each of surgical, anaesthesia and nursing team were designated to don personal protective equipment (PPE) and then to enter the operating room. The assigned team donned category I PPE, as recommended by the government of Nepal and Nepal Medical Council. One individual from each of surgical, anaesthesia and nursing team remained outside the operating room, to provide assistance, in the event of emergency or any complications. The objective was to ensure safety, as well as to minimize the number of health care workers potentially exposed in the operating room. After donning the PPE, patient was transferred from COVID ICU or ward to operating room, accompanied by the assistant surgeon and a nurse. In the operating room, the cases were reviewed by the anaesthesiologist, including history and physical examination, airway evaluation, premedication, suction, airway equipments, video laryngoscope and emergency drugs. Surgical checklist, as per the institutional policy, was implemented to minimize errors. Due to lack of airborne isolation facilities in our operating room, we exercised a couple of precautions to minimize exposure, in the event of the need for aerosol generating procedure. All the health care workers in the operating room donned with category I PPE (as per the recommendations from the government of Nepal),⁴ number of health care workers were limited in the operating room, as stated above, also there was provision of videolaryngoscope and aerosol box, in the even of the need for endotracheal intubation.

All three surgeries were performed under subarachnoid block. All the individuals entering the operating room donned with category I PPE. There is a separate designated area for donning and doffing. To avoid fogging of the visor or goggle, mask seal was ensured and the N95 mask was tapped along the upper margin to avoid escaping of exhaled air. None of the patients had contraindications for spinal anaesthesia. Hyperbaric bupivacaine at the concentration of 0.5% was administered using 25 gauge Quincke needle, with patient in sitting position. Volume of 3.5ml was administered for the first case and 2.2ml was administered for Caesarean deliveries. All

procedures were performed under aseptic precautions and under standard monitoring. Surgical mask was applied to the face of the patient at all time during surgery. Intraoperative course of all three cases were uneventful. Fetal outcome of both second and third cases were good. The newborns were transferred to COVID isolation ward. RT PCR of the newborns were negative. Disinfection, handling of wastes and sharp objects were performed as per the hospital policy. Suction bottle was filled with 5000ppm solution of sodium hypochlorite through suction lavage with ratio of 1:1. Disposal buckets with plastics were available for disposable waste, reusable waste, sharp objects, red bucket for instruments and red bucket for pouring suction. Donning and doffing was done at a designated area meticulously and under supervision of a trained infection prevention and control nurse. After surgery, debriefing was done among the team members.

There is no policy for the selection of cases with COVID 19. Our hospital was receiving any cases irrespective of COVID status. For the emergency and semi-emergency cases if the cases is suspected to be COVID positive then PCR is sent, but the reports are not awaited for performing surgery. The case was considered as COVID positive and all the precautions undertaken. For the elective cases if there was no suspicion for COVID 19, surgery would performed as usual. If there was suspicion then PCR would be performed and waited for the report. Surgery would performed according to the report of the PCR. We carefully selected patients for surgery considering the increased risk both for the patients with COVID-19 and for the team involved in surgery. In all three cases surgery was indicated and was not feasible to postpone.⁵ Caesarean delivery was considered in the second and third case despite the increased maternal risk of surgery, as normal vaginal delivery.⁶ Caesarean delivery of second and third cases were planned electively to avoid the possibility of emergency transfer of the patient to operating room and possible need of general anaesthesia in such circumstances. Controlled and planned procedure would permit time for better preparedness and would improve safety.⁷ Spinal anaesthesia was preferred to general anaesthesia as all

three surgeries was possible under spinal anaesthesia and to avoid intubation, which would potentially expose the anaesthesiologist to airway secretions and high viral load.⁸

As the global pandemic of COVID-19 keeps spreading, the Low and Middle-Income Countries (LMICs) are progressively getting affected. Health care systems of LMICs are stretched at baseline and most centers are not designed or planned to function during the event of pandemic or disaster.⁹ A recent nationwide survey from Nepal showed that most hospitals are sub-optimally prepared to handle the COVID-19 pandemic.¹⁰ Our center faced similar challenges owing to limited resources, infrastructure not designed to handle the pandemic and multiple organizational issues. Our hospital activated the hospital incident command system well in advance of the case surge and toiled to optimize the available resources to handle the pandemic.³ We had contingency plans at three phases, to handle the foreseen case surge. With the leadership of infection prevention and control committee, hospital provided hands-on training on donning and doffing for all the health care workers. A dedicated operating room for COVID-19 patients, along with floor and movement plans were formulated in advance. Multiple hospital protocols were implemented. Practice drills were performed. To address the possible short supply of PPE, PPE and N95 mask used were not quality tested due to lack of institutional and national policy. Such policy in future would enhance safety of health care workers, if it were done. To preserve the limited resources, elective surgeries were largely limited. Emergent and urgent cases, classified as loss of life or limb if an active intervention was not done soon, were considered for surgery, and other cases were postponed. The orchestrated and dedicated efforts of health care workers from different specialty was central to the successful and safe anaesthetic management of patients with COVID-19 in our center.

The health care workers involved in the procedure were given two options. Even after wearing the full PPE gear, if they wanted to stay in isolation, the center provided accommodation and food till the PCR test results were available. They were also given the option of staying in isolation at home if they developed symptoms.

After these experiences, we put forward the requirement of anti-fogging goggles and Visor for the procedures. We have now been provided with them. The creation of a negative pressure room is still a challenge but we have been trying to create a negative pressure box to contain any aerosol that would be generated.

CONCLUSIONS

Safe anaesthetic management of patients with COVID-19 during the global pandemic and local case surge is challenging in places with resource limitation, like ours. Meticulous planning and preparedness to optimize the available resource, yet ensuring safety, is crucial.

REFERENCES

1. World Health Organization. Coronavirus (COVID-19). (Accessed June 16, 2020) Available from: <https://who.sprinklr.com/>
2. Government of Nepal, Ministry of Health and Population. COVID-19. (Accessed June 16, 2020). Available from: <https://covid19.mohp.gov.np/#/>
3. Adhikari S, Rijal S, Acharya PK, Sharma BP, Ansari I, Rajbhandari P, et al. Hospital incident command system, the pillar of COVID-19 outbreak response: an experience from Patan Hospital, Nepal. *Journal of Patan Academy of Health Sciences*. 2020;7:80-4. [\[FullText\]](#)
4. Government of Nepal, Ministry of Health and Population. Guidelines for the use of PPE in relation to Covid-19, Nepal. (Accessed July 3, 2020). Available from: <https://nheicc.gov.np/2020/03/30/guidelines-for-the-use-of-ppe-in-relation-to-covid-19-nepal/>
5. Doglietto F, Vezzoli M, Gheza F, Lussardi GL, Domenicucci M, Vecchiarelli L, et al. Factors associated with surgical mortality and complications among patients with and without Coronavirus Disease 2019 (COVID-19) in Italy. *JAMA Surg*. 2020 ;155(8):1-14. [\[PubMed\]](#)
6. Martinez-Perez O, Vouga M, Melguizo SC, Acebal LF, Panchaud A, Munoz-Chapuli M, et al. Association between mode of delivery among pregnant women with COVID-19 and maternal and neonatal outcomes in Spain. *JAMA*. 2020;e2010125. [\[PubMed\]](#)
7. Bauer ME, Bernstein K, Dinges E, Delgado C, El-Sharawi N, Sultan P, et al. Obstetric anesthesia during the COVID-19 pandemic. *Anesth Analg*. 2020;131:7-15. [\[PubMed\]](#)
8. Odor PM, Neun M, Bampoe S, Clark S, Heaton D, Hoogenboom EM, et al. Anaesthesia and COVID-19: Infection control. *Br J Anaesth*. 2020;S0007-0912(20)30200-2. [\[PubMed\]](#)
9. Siow WT, Liew MF, Shrestha BR, Muchtar F, See KC. Managing COVID-19 in resource-limited settings: Critical care considerations. *Crit Care*. 2020;24:167. [\[PubMed\]](#)
10. Shrestha GS, Paneru HR, Acharya SP, Shrestha SK, Sigdel MR, Tiwari S, et al. Preparedness of Coronavirus Disease in hospitals of Nepal: A nationwide survey. *J Nepal Med Assoc*. 2020;58:248-51. [\[PubMed\]](#)