Case study

Anaesthetic management of suspect COVID-19 patient during a COVID-19 pandemic presenting for emergency surgery.

Abstract :

Covid-19 pandemic is an unprecedented crisis and has changed dynamics of health care by severely straining the resources for patients coming for both elective and emergency surgeries. Ultrasound guided nerve block has been a life saver in most covid patients coming for emergency surgical procedures as they reduce the risk of general anaesthesia in a patient with already compromised lung physiology and also minimizes risk of aerosol contamination to operation theatre and health care personnel. We describe the anaesthetic management of a 67year old male patient with uncontrolled diabetes and sepsis for diabetic foot wound fasciotomy and wound debridement. The patient was operated under ultrasound guided popliteal sciatic and Saphenous nerve block of the right lower limb with all precautions taken to prevent covid spread as the patient had a high index of suspicion for covid-19. The patient was reported positive for RT-PCR in the postoperative period.

INTRODUCTION :

COVID-19 patients coming for emergency surgery pose a challenge to the Anaesthesiologists. On the one hand there was severe manpower crisis when most anaesthesiologists were diverted towards taking care of covid patients admitted to the intensive care unit. On the other hand, anesthetizing Patient whose respiratory and cardiac reserves are severely compromised at the same time minimizing the spread of infection within the operation theatre and to the health care personnel involved in the patient care was an arduous task.

General anaesthesia involves invasive airway manipulation both during intubation and extubation leading to aerosol generation and high risk of transmission of respiratory infection to the health care personnel involved (1).according to a systemic review the odds ratio of transmission of infection by aerosol during airway manoeuvres like intubation is 6.6.(2)Ideally the operation theatre should be a negative pressure room to minimize the risk of transmission of virus during aerosol generating manoeuvres(3) but most of the operation theatre in India are positive pressure system . Neuraxial anaesthesia and peripheral nerve blocks are considered more safer as they do not involve aerosol producing manoeuvres and should be considered over general Anaesthesia (4,5). We report the anaesthetic management and precautions taken in a suspect covid patient coming for emergency surgery.

CASE REPORT :

A 67year old male patient presented to the emergency department with diabetic foot of the right leg with gangrene of right great toe and swelling of the foot. He was conscious and oriented but dyspnoeic and tachypnoeic. He was tachycardiac with a heart rate of 120 beats per minute and blood pressure of 110/60 mmHg. His haemoglobin was 8.2 g/dl and total leucocyte count was 20300 cells/cu.mm. His blood group was O-ve. He had uncontrolled diabetes with a HbA1c of 13 and fasting blood sugar of 351 mg/dl. His creatinine value was 2.03 mg/dl, sodium and potassium were 123meq/L and 2.8meq/L respectively. The bilirubin values were slightly increased to 1.22mg/dl and alkaline phosphatase was 226 IU/L. Urine tested negative for ketone bodies. ECG suggested an old inferior wall myocardial infarction. His room air saturation was around 89 to 90% and ABG showed a po2 of 53.2 mmHg. X-ray chest showed diffuse bilateral infiltrates. His HRCT-chest showed multiple patchy areas of consolidation with ground glass opacity involving bilateral lung fields both centrally and peripherally. Multiple enlarged mediastinal nodes were present with minimal left sided pleural effusion. He was known case of coronary artery disease on tablet clopidogrel 75 mg and aspirin 75 mg. The acute lung involvement was highly suggestive of covid 19 infection. He was diagnosed with uncontrolled type 2 diabetes, acute on chronic kidney disease most probably due to diabetic nephropathy with anaemia, hyponatremia and sepsis secondary to gangrene in the toe. He was posted for fasciotomy with wound debridement of diabetic foot.

In the operation theatre, standard ASA monitors were attached. The patient was started on insulin infusion and normal saline infusion to correct hyponatremia. Using ultrasound guidance, the right sciatic nerve was identified just proximal to the popliteal fossa and the

saphenous nerve was identified at the adductor canal using a high frequency linear transducer probe and 0.375% Ropivacaine was injected to block the nerves. 30 ml of the solution was used to block the sciatic nerve and 5ml was used to block the saphenous nerve. The block was performed by a senior consultant and the patient was handed over to the surgeon. Broad spectrum antibiotics were given once the sample was taken for pus culture and sensitivity. The surgery went on for 50 minutes uneventfully and patient was shifted to the designated postoperative isolation ward for postoperative monitoring and critical care. The patient turned out to be covid-19 positive and was managed according to our hospital protocol.

DISCUSSION :

We were faced with the problem of operating on a suspected covid positive patient with uncontrolled diabetes mellitus in sepsis with renal dysfunction and electrolyte imbalance. The RT -PCR test usually takes 12 hours to confirm covid infection but we couldn't wait that long as the patient had to be taken up immediately for surgery to remove the infective foci and salvage the limb. Blood products could not be arranged as the blood bank did not have adequate reserves of O negative blood because of the paucity of donors due to the pandemic.

Regional anaesthesia was planned as his covid status was not yet confirmed. Subarachnoid block is not contraindicated in covid patients and should be considered as the first choice because of low aerosol generation (5) and lot of publications have come

out quoting the safety of neuraxial block in surgical patients with COVID (6,7). However, it should be kept in mind that many patients with COVID-19 may have thrombocytopenia (8) and the virus has been isolated from cerebrospinal fluid of infected patient (9). Our patient had a normal platelet count but was on aspirin and clopidogrel so we decided that ultrasound guided block of the popliteal sciatic and Saphenous nerve was a better option. A lower concentration of local anaesthesia was used, as only sensory block was desired, and the toxic dose would be less in this patient due to metabolic consequences secondary to acute on chronic renal failure. The patient was shifted to the operating room with Hudson oxygen mask at 5 litres/min and a surgical mask was placed over the oxygen mask to reduce dispersion of droplets. Oxygen supplementation was kept to 5 litres/ min and a face mask was preferred over a nasal prong to reduce aerosol generation and dispersion with high oxygen flow rates (10). The goal was to minimize aerosol generation and dispersion with least amount of oxygen flow to maintain oxygen saturation.

Minimal number of personnel were involved during the procedure and all of them were provided with fluid resistant gowns, gloves and face shield with N95 mask. Usually, surgery under regional blocks is not considered aerosol generating but given the general status of the patient and keeping in mind the need for airway assistance any time during intraoperative period, a full airborne precautionary PPE was used. Standard ASA monitors were used. Preoperative and procedural sedation were not given to avoid respiratory compromise. The right sciatic was identified just proximal to the popliteal fossa and the Saphenous nerve was identified at the abductor canal using a high frequency linear transducer probe and 0.375% Ropivacaine was injected to block the nerves. 30 ml of the solution was used to block the sciatic nerve and 5 ml was used to

block the Saphenous nerve. We did not add any additive to the block. Our usual additive is either dexmedetomidine or dexamethasone as they prolong the duration of analgesia postoperatively. Dexamethasone was avoided because of the possibility of immunosuppression in an already septicaemic patient and dexmedetomidine was not used to avoid hypotension and sedation. The block was done by the senior consultant and the patient was handed over to the surgeon after confirming the block success so as to minimize the need for intraoperative conversion. It took 20 minutes for the block to be fully effective. Extra onset time was given for the block to fully act so as to reduce the incidence of intraoperative conversion to General anaesthesia. The patient was wearing a surgical mask during the entire intraoperative period. The surgery went on for 50 minutes uneventfully and patient was shifted to the designated postoperative isolation ward for postoperative monitoring and critical care. The patient turned out to be COVID-19 positive and was managed according to our hospital protocol.

CONCLUSION :

Regional anaesthesia is a effective armamentarium for the anaesthesiologist in COVID times and nerve blocks help us to give a safe anaesthesia with minimal hemodynamic alterations in the otherwise already compromised patients and also minimizing the chance of aerosol spread of infection to the other health care workers. It should be the choice of anaesthesia whenever possible in both COVID positive and suspect COVID patients.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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