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A RETROSPECTIVE STUDY OF THE OUTCOME AFTER ANAESTHESIA IN COVID19 POSITIVE PATIENTS POSTED FOR EMERGENCY SURGERY

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ABSTRACT **Objective:** The objective of this study was a retrospective analysis of the outcome after anaesthesia in covid-19 positive posted for emergency surgery. **Background and Aims:** We had done a retrospective analysis of the outcome after anaesthesia in covid-19 positive patients posted for emergency surgery. Our aim was to find out common surgical emergencies in covid positive patient, post operative outcome of patient and its correlation with pre operative NEWS score, Common type of anaesthesia given and its outcome after anaesthesia. **Materials and Methodology:** After approval from ethical committee total 52 covid 19 positive (either RAT or RTPCR) who underwent emergency surgery from May 2020 to Dec 2020 were included in this study. Analysis was carried out in GMCH ,Aurangabad having Covid OT, ICU setup and critical care teams. **Results:** We had done retrospective analysis of Covid 19 patients who underwent emergency surgery under either GA or regional anaesthesia. We found that 52 COVID 19 patients underwent emergency surgery in our institute. Amongst all LSCS was a most common surgical procedure performed in 73% (38)cases, Exploratory laparotomy was done in 15.3%(8)cases, Debridement was done in 3.8% (2)cases, FESS was performed in 3.8%(2)cases, above knee Amputation in 1.9%(1)case and Appendicectomy in 1.9%(1)case. Spinal anaesthesia was given in 75 %(39) patients and recovery was uneventful in all patients. General anaesthesia was given in 25%(13)cases out of which 76.92%(10) cases recovered and mortality was observed in 23.07%(3)cases. Postoperative ICU care is needed in 17.3% (11)cases. out of which 81% (9) cases required invasive ventilation and 18.1%(2) cases required non-invasive ventilation.Complications developed (either intraoperative or postoperative) in 5 (9.61%) cases. Cases with NEWS <7 have recovery rate 97.8% and NEWS score >7 have recovery rate 66.6%. Overall recovery rate was 94.23% (49) and death rate was 5.76%(3). **Conclusion:** In covid 19 positive patients most common surgery performed was LSCS under spinal anaesthesia having high recovery rate, less intraoperative and postoperative complications, no ICU admission and no any mortality. We observed high mortality in patients with NEWS score more than seven and associated comorbidities.

KEYWORDS : Covid Protocols, News Score, Regional Anaesthesia.

INTRODUCTION

In this covid 19 era many covid 19 patients may need emergency surgeries like LSCS, exploratory laparotomy , cleaning and debridement. Perioperative management of covid 19 disease patients is challenge for anaesthesiologists. Critical condition of patient, poor post-operative outcome, need of postoperative intensive monitoring , treatment of emergency surgical conditions and covid infection and risk of transmission of infection are the concerns for anaesthesiologist. Careful anesthesiologic planning is recommended to minimize any infection potentially associated with unexpected complex endotracheal intubation procedures [(1)] To prevent this all, staff must be specifically trained to don, doff, and dispose of personal protection equipment (PPE), including masks (level 2 or 3 filtering face piece (FFP) depending on the aerosol- generating risk level), eye protection gears, double non-sterile gloves, gowns, suites, caps, and socks [(1)] Movement of staff between operating theatres should be severely curtailed in order to avoid cross-contamination [(2).]

Transmission of 2019-nCoV probably occurs by means of large droplets, less so by means of aerosol Fomite and exposure to oral and respiratory secretions at the time of endo-tracheal intubation puts anaesthesiologists at high risk for infection [(3).] As airway manipulation is considered to be aerosol generating, besides minimising the number of nonessential personnel in the operating theatre and donning appropriate personal protective equipment, we propose an added safety measure of observing guidelines related to the operating theatre's air changes per hour for the removal of 99% of airborne contaminants [(2)]Care should be taken while intubating, ventilating and extubating the patient. According to ASA guidance do procedures and studies essential for patient care, HEPA filter inserted at tracheal tube/Y piece and Patients who are not ventilated should wear a surgical mask [(4,6)] . Reduction of surgical and interventional procedures should be done. Prioritization to critical procedures should be given.

Furthermore diagnosis before posting patient for surgery is important in the effort to prevent cross-infection. Body temperature, laboratory findings, and chest x-ray and CT findings should be confirmed before a patient enters the operating room [(3)].Logic suggests that regional anaesthesia reduces the risk of severe acute respiratory syndrome related coronavirus-2 (SARS-CoV- 2) transmission from patient to staff 5 .Regional anaesthesia is therefore preferred and procedures should take into consideration appropriate precautions, especially regarding COVID-19 patients or those suspected of having COVID-19.

MATERIAL AND METHODS

Retrospective study was conducted on patients operated in COVID centre of GMC, Aurangabad. Ethical and statistical consideration of study was conducted in accordance with ICH - GCP, CDSCO-GCP guidelines, Declaration of Helsinki (October 2000) and amended schedule-Y (2005). Study was approved from the IEC / IRB (Institutional Ethical /Review Board). All covid -19 positive patients posted for emergency surgery were included in this study. We observed that 52 COVID 19 positive (either RAT or RTPCR) underwent emergency surgery. The duration between onset of first symptom of covid and day of surgery was noted.

All patients were investigated in details including Hb%, TLC, DLC, N:L ratio, BSL, LFT, KFT, Serum LDH, Serum Ferritin, D Dimer, C Reactive Protein, ECG and Xray chest PA view and in severe disease ABG, IL6 and Procalcitonin were done. To assess severity of covid 19, NEWS score was noted in which patient's RR, SPO2 on room air, PR, BP, Temperature and Consciousness were noted. [**NEWS** score considered as Mild if score 0-4, Moderate if score 5-6 and Severe if score > 7]

After detailed investigations, a written informed consent of patient and relative was taken. Patient was kept NPO (nil per orally) six hours prior to surgery. All surgeries were carried out in covid operation theatre to prevent transmission of infection. Type of surgical procedure and type of anaesthesia were noted. Recovery of patient in immediate postoperative period was assessed. Need of shifting patient in covid ICU, need of non-invasive or invasive ventilation after surgery, intraoperative complications and complications immediately after operation like hypotension, bradycardia or tachycardia , arrhythmia, ARF, delayed recovery were noted. Number of patients discharged from hospital and number of deaths in postoperative period along with cause of death were assessed from records.

OBSERVATION AND RESULTS

Total 52 covid 19 patients underwent emergency surgical procedure in our institute.

LSCS was the commonest surgical procedure performed in 38 (73%) patients, Exploratory laparotomy was performed in 08 (15.3%) patients , Debridement and FESS done in 02(3.8%) patients each, while Above Knee Amputation and appendectomy was performed in 01(1.9%) patient each.

Amongst all these patients 49 (94.23%) patients recovered .In 44 patients News score was 0-4, while in one patient it was 5 and in four patients it was above 7. We observed death in 3 (5.76%)patients. Spinal anaesthesia was given in 39 patients and all these patients were shifted to ward and recovered completely. General anaesthesia was given in 13 patients, 11 patients were shifted to ICU ,9 patients required invasive ventilation . Out of these 13 patients ,3 patients died.

Out of these, 43(82%) patients were less than 50 years and all recovered. Where as out of 9 patients who were more than 50 years of age only 6 patients recovered while 3 patients died .

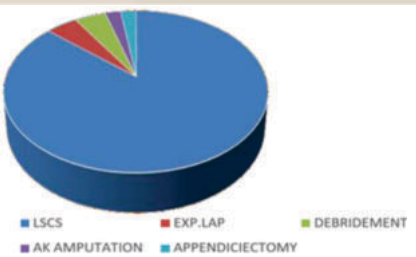
11 patients had comorbidities , 9 patients recovered and death was observed in 2 patients. Total 49 (94.23%) patients were discharged from hospital while death occurred in 3(5.76%) patients.

In 34 (65.5%) patients, admission was done on same day, in 16 (30.7%) patients, surgery was performed two days after admission. We observed death in 3 patients who underwent surgery on the day of admission. Death occurred in three patients (5.76%).Out of these 3, cause of death in 2 patients was severe ARDS with bilateral pneumonitis with cytokines storm and coagulopathy in covid 19 positive with septicaemic shock while in one patient cause of death was ARDS with bilateral pneumonitis with cytokines storm with coagulopathy in covid 19 positive with known case of HTN & IHD.

Table showing NEWS Score

Physiological parameter	Score 3	2	1	0	1	2	3
Respiration rate (per minute	≤8		9-11	12-20		21-24	≥25
SpO_2 Scale 1 (%)	≤91	92-93	94-95	≥96			
SpO_2 Scale 2 (%)	≤83	84-85	86-87	88-92 ≥93 on air	93-94 on oxygen	95-96 on oxygen	≥97 on oxygen
Air or oxygen		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91-100	101-110	111-219			≥220
Pulse (per minute)	≤40		41-50	51-90	91-110	111-130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1-36.0	36.1-38.0	38.1-39.0	≥39.1	

NEW score	Clinical risk	Response
Aggregate score 0–4	Low	Ward-based response
Red score Score of 3 in any individual parameter	Low–medium	Urgent ward-based response*
Aggregate score 5–6	Medium	Key threshold for urgent response*
Aggregate score 7 or more	High	Urgent or emergency response**



Observations

DISCUSSION

Perioperative management in emergency surgery in covid 19 positive patient is a challenge due to COVID 19 infection, surgical complications, risk of transmission of infection in medical and paramedical staff and need of postoperative intensive care. when possible, all surgical procedures on all suspected COVID-19 patients should be postponed until recovery of patient from COVID. If senior Anaesthesiologist and surgeons are exposed to infected patients, the possibility of transmission of infection is very high and require self-isolation leading to shortage of seniors. Allocating dedicated senior staff to key management roles is crucial to minimize COVID-19 spread1

When possible, all surgical procedures on all suspected COVID-19 patient should be postponed until confirmed patients recovered from covid 19 infection. If senior Anaesthesiologist and surgeons are exposed to infected patients, the possibility of transmission of infection is very high and require self-isolation leading to shortage of seniors. Allocating dedicated senior staff to key management roles is crucial to minimize COVID-19 spread1.

All staff must be specifically trained to don, doff, and dispose of PPE including masks , eye protection, double non-sterile gloves, gowns, suites, caps, and socks. Careful anesthesiological planning is recommended to minimize any infection potentially associated with unexpected complex endotracheal intubation.2 The routine act of lung auscultation can also be challenging with powered air-purifying respirator use, thus assessing chest expansion and capnography is imperative.1)Designated COVID operating areas (COA) must be allocated to COVID patients. Whenever possible, it is important to minimize to number of people working on a single infected case ideally, this should also apply to cases spanning over multiple shifts. 1)Negative pressure ORs (operating room) would be ideal to minimize infection risk. However, Operating rooms are normally designed to have positive pressure air circulation. A high air exchange cycle rate (≥ 25 cycles/h) contributes to effectively reduce the viral load within operation theatre. In operating rooms in which infection control procedures are rigorously applied, the risk for staff to contract 2019-nCoV from patient contact is low, despite long exposure times 3

Prevention of cross-infection in the operating room by means of implementing anaesthesia and infection control management procedures for emergency procedures in patients with confirmed or suspected COVID 19 3. Most patients with confirmed or suspected COVID 19 presented with fever and dry cough and demonstrated bilateral multiple mottling and ground-glass opacity on chest computed tomography scans3. Airway manipulation is associated with some of the highest rates of coronavirus transmission 5. Furthermore, diagnosis before the patient enters the operating room is important in the effort to prevent cross-infection.

Body temperature, laboratory findings (especially lymphocyte count), and chest x-ray and CT findings (especially multiple mottling and ground-glass opacity) should be confirmed before a patient enters the operating room. If the patient has a fever of unknown cause, the examination results show pulmonary infection or low oxygen saturation of unknown cause. (< 90%), and the surgery is not an emergency case, anaesthesiologists should communicate to the patient, family, and the surgeon that the surgery should be suspended3 ,6) There should be reduction of surgical and interventional procedures. Non critical procedures should be rescheduled to a date when community transmission is no longer taking place. Time critical procedures must be prioritized according to patient need and resources of facility therefore there should be prioritization of procedures according to institutional algorithm.

Logic suggests that **regional anaesthesia** reduces the risk of severe acute respiratory syndrome related coronavirus-2 (SARS-CoV-2) transmission from patient to staff 5).

Despite the finding that COVID-19 is associated with hypercoagulability, there is a link between COVID-19 and thrombocytopaenia 5 . a full blood count should be reviewed before performing a neuraxial procedure in anyone with COVID-19. Beyond superior analgesia benefits like reduced postoperative complications, bypassing or reducing time in recovery, and earlier hospital discharge are particularly valuable. Avoiding a general anaesthetic in patients with active COVID-19 undergoing urgent surgery is likely to be beneficial. With evidence accumulating that volatile anaesthesia may contribute to decreased perioperative immunity in general anaesthesia 5, therefore regional anaesthesia is preferred.

A surgical mask or N95 mask must be applied to the patient throughout the length of stay in the operating room7). Spinal anaesthesia is still recommended as the primary choice of anaesthesia for cesarean delivery in a mother with COVID19.**General anaesthesia** can be used as a backup plan in case spinal anaesthesia fails or if general anaesthesia is indicated 7. During preoxygenation, it is recommended to cover the patient's nose and mouth with two layers of wet gauze to block some of the patient's secretions and place the anaesthesia mask superimposed onto the wet gauze[7]. Sufficient muscle relaxation should be obtained to prevent coughing during intubation 7.1)

Oral intubation with a **video laryngoscope or bronchoscope**, if available, is preferred. the **fiberscope** can also be used for intubation after induction of anaesthesia because it may significantly increase the distance between the patient's airway and that of the anaesthesiologist who performs the intubation7. **Trans nasal bronchoscopic** intubation could be an alternative option when oral intubation is impossible or contraindicated. A closed airway suction system, if available, is recommended to reduce viral aerosol production.

Once the patient meets the criteria for estuation, he or she should be extubated in the operating room. Before exhumation, two layers of wet gauze can be used to cover the patient's nose and mouth to minimize exposure to the patient's secretions during extubation can use antitussive before estuation to decrease cough reflex.

Patient should be either shifted to Covid ICU or in isolated ward for further management as per patients general condition7. In **Uni**nterrupted 6-hour shift with a 1-hour overlap was perhaps the most reasonable system as it allowed for a shift which was humanly feasible without the wastage of PPE which would occur by breaking the shift into two halves.

If health care workers develop symptoms of Covid 2019 infection, such as fever, cough, soreness, and feebleness, after contact with suspected or confirmed cases, evaluations such as blood test, C-reactive protein, and pulmonary imaging should be acquired in a timely fashion. Moreover, they also should immediately report them to the hospital and isolate themselves.

At home3 high flow nasal oxygen may reduce the need for ventilation, and possibly thereby reduce the mortality of patients. lowering HFNC flows while increasing FiO2, placing a mask over the HFNC cannula, not handling the nasal prongs, removing the cannulas from the back, and disposing the nasal cannula in a safe manner in the yellow waste bag should be practiced.equipments that directly or indirectly contact patient's skin or mucosa like video laryngoscope, filters, suction tubes, catheters, end expiratory carbon dioxide sampling tubes should be discarded after single use to prevent transmission7.

CONCLUSION

In this analysis we observed that Emergency LSCS was the most common surgery and Spinal anaesthesia was the most common anaesthesia given. Strict aseptic precautions, training of all medical and paramedical staff, dedicated operation theatre, good postoperative care and ICU admission if needed were helped to low mortality rate amongst covid 19 patients.

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