OUR EXPERIENCE OF SURGERIES IN COVID-19 PATIENTS AT PAK EMIRATES MILITARY HOSPITAL RAWALPINDI

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ABSTRACT

The pandemic of COVID-19 corona virus is the most deadly and frightening situation of our times and it is the greatest challenge to which whole world is exposed. We are fighting this pandemic since February 2020 and up till now there is increased surge of cases. Pak Emirates Military Hospital has been declared as corona special hospital, all entitled cases that are corona positive and need surgeries are being operated here. Special protocols and rules have been designed by hospital management and consultants of different specialities to minimize the risk of cross contamination.

Keywords: COVID-19, Cross contamination, Pak Emirates Military Hospital.

INTRODUCTION

COVID-19 is a deadlier that suffused all over the world in no time. The first ever case of COVID-19 showed up in China on 17th November 2019[1] and it started spreading like a fire especially in European countries however the outbreak was not similar in different countries and there was disparity in statistics. In Pakistan the first case was reported and confirmed on 26th of February in a 27 year old boy who travelled from Iran[2]. Initially in Pakistan the number of positive cases reported were less, with the passage of time it gained speed such that by mid June the number of positive cases were very high. Keeping in view of increasing number of patients the number of ICUs, HDUs and isolation wards were increased in all the hospitals of Pakistan.

In April 2020, Pak Emirates Military Hospital was declared as COVID-19 hospital. It was the only Military Hospital in Pakistan specified to deal with COVID-19 positive patients. Pak Emirates Military Hospital is a 1200 bedded tertiary care hospital. All the emergency surgeries were decided to be done in Combined Military Hospital Rawalpindi whereas all elective surgeries were deferred to later stage[3]. Surgery of patients with Polymerase Chain Reaction + for COVID-19 decided to be carried out at operation theater complex PEMH Rawalpindi. According to the latest Word Health Organization guidelines and instructions of Director General surgery revised by medical directorate the protocols regarding donning, doffing, disinfection of operation theater and its equipment, transfer of patient to and from operation theater, conduct of anaesthesia were enlisted and ensured. Operation theater staff, anaesthetist and surgeons were organized into teams that worked accordingly, on call shift basis.

The aim of this article is to share the experience of conducting only emergency surgeries of COVID-19 patients under the resources available and to emphasize that although it was a new challenge nobody was accustomed to but with strict following of protocols we can prevent spread of infection and deal with unforeseen things.

Operating Room Preparation

We prepared the operating rooms keeping in mind to provide adequate degree of protection to the operation theater team. As negative pressure is recommended[4] for COVID-19 but we had positive pressure system in operation theater which we closed. There are 10 operating rooms out of which we selected the most distal ones close to outlet[5]. As compensation frequency of air chan-

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ges was increased to more than 25 per hour. In addition the ventilation system had integrated High Efficiency Particulate Air (HEPA) filters. All the unnecessary entrances were closed. Sign boards were displayed with instructions on. Equipment not required in operation theater was removed and those which cannot be removed was covered with plastic sheets. Anaesthetic trolleys were sufficiently stocked with preprepared drugs before start of surgery because visualization/access to equipment and drugs is suboptimal due to vapour condensation on eye shields. Surgery trolleys were precausiously prepared. There were dedicated containers for infected and sharp disposal. Alcohol solution was kept available in adequate quantity for hand hygiene. All the material like linen was disposable[6].

Dress Code

World Health Organization continues to recommend airborne precautions in conditions/ procedures where aerosol spread is suspected. Use of PPE in operating room was made mandatory for every person inside operation theater. Every time in every case new PPE was issued per person. PPE kits included gown, shoe covers, caps, 2xgloves, N-95 mask, goggles and visor. Lectures were carried out on Donning and Doffing with simulation based training. Self contamination is highest during doffing, touching face/ hair before hand washing was taught to be strictly avoided, after doffing whole body shower followed including oral, nasal disinfection with Povidone-Iodine (Polyvinylpyrrolidone-Iodine) intranasally and intraorally in the form of nasal sprays and mouth washes. Protocols were displayed over the dedicated areas of donning and doffing[7].

Patient Receiving

Surgeries which cannot be deferred or emergency surgeries were carried out in operation theater. Time of surgery was communicated to anaesthesia team well before time. Pre anesthesia evaluation was done in ward/HDU/ICU by a dedicated anaesthetist wearing PPE. History, physical examination and investigations were reviewed. Relevant consultation from other specialities were carried out as per requirement. When deemed fit patient was called to the operating room. As this hospital is for COVID patients we have marked the routes for patient transport. Ambulance staff and ward staff accompanying patients were wearing PPE. We used ramp for transfer and shifting of patients to and from operation theater and we stopped using the normal elevators of the building. Operation room assistants used to wear PPE and receive the patient in area directly leading from the ramp to the operating room, no extra reception staff was involved[8].

Conduct of Anaesthesia

As per international guidelines published we used regional anesthesia except where contraindicated[9].

Anesthesia machine used was same for all cases. No non COVID patients were done in between, therefore soda lime was not changed. However portable High Efficiency Particulate Air (HEPA) filters were used in circuits. All non intubated Patients were always wearing a N95 mask. In addition the patients were covered by a polythene sheet to minimize the aerosol spread in the environment. Keeping in mind of aerosol generating procedures (AGP) like tracheal intubation, extubation, tracheostomy and mechanical ventilation, preoxygenation was done for 5 minutes during which a two layered wet gauze was placed over patients' mouth and nose to minimize aerosol spread. Anaesthesia mask was superimposed on the wet gauze and was held with two handed technique to ensure a proper seal. While patient is covered by sheet, We made two slits at the head end of the polythene sheet for minimum aerosol spread during intubations. Closed suction system was also available for suctioning. Meticulous airway assessment was carried out before induction and most experienced anaesthetist carried out the intubation expeditiously. Patient was given succinylcholine for rapid sequence induction to avoid manual ventilation followed by intubation using laryngoscope with LED light and endotracheal tube that had

a stylet already in place even for an apparently easy intubation. Video laryngoscope and fiberoptic was kept available in case of any unexpected difficult intubations. No high flow oxygen flush was used at any stage. No nebulization was carried out on operation theater table. We followed a few minutes pause protocol while intubation and extubation in which we allowed only anaesthesia consultant and anaesthesia assistant to stay in operation theater as this was the most vulnerable time for spread of infection. There was no difference in Intraoperative monitoring. Extubation was done inside operation theater after lignocaine 1.5 mg per kg to prevent contamination through coughing. Laryngeal mask airway was replaced with endotracheal tube while patient was in adequate depth of anaesthesia but breathing spontaneously thus preventing bucking and coughing on the tube. Patients were recovered inside operation theater and shifted back to ward/HDU/ITC bypassing the recovery area. However documentation was done once case was finished and outside the contaminated environment.

Baby Resuscitation

Caesarean section was the most common surgery done during COVID pandemic. As soon as baby was delivered, was covered by drape sheet to limit exposure to environment. Baby resuscitation was carried out in adjacent room, was disinfected by a warm water bath and handed over to Paedriatic staff. They were also alerted well before time so that they had adequate time to wear PPE and to do all arrangements to receive the baby[10].

Limited Number of Staff

Right from the start we made two anaesthesia teams. Each team was headed by one consultant anaesthetist. Residents were present in the department for any emergency round the clock. Consultant was available in the working hours however after that consultant was on call. Limited number of staff had been used for each surgery which saved our resources and decreased exposure. There was no recovery staff involved in patient care, same staff would recover the patient and shift to ward. This limited our staff involvement in each case[11]. Exposure was limited to few members of the team. Most of the surgeries were done by the senior members of the team. Members of team were closely monitored for any sign symptoms of fever cough and myalgias. Although screening test was done 5th day after exposure, however we kept on educating our staff to self monitor for any symptoms and report to hospital COVID OPD for screening if required.

We used 5 members inside operation theater for each surgery. Duties of aya was taken over by operation theater nurse. 1 x anaesthesia assistant and 1 x surgery assistant with a surgical and anesthesia consultant. 1 x assistant is available outside operation theater for any help required, once case was started nobody was allowed to leave the operation theater. Same staff was utilized for shifting of patient to ward or disinfection of operation theater and washing of instruments.

Workload

Although the work load was less (table) compared to previous data before COVID-19 but the experience was altogether new, unique and different. Receiving a patient covered in polythene sheet when you are wearing personal protective equipment, face to face communication with patient is not possible, patient and anaesthetist comfort level is not enough. Personal protective equipment in itself is not a very comfortable dress the material doesn't allow enough air circulation and temperature of our country adds on to the level of discomfort. For each surgery Limited staff and additional work like donning, doffing, disinfection after surgery increases the time con-

Table: Workload.

S. No.	Operations	No. of Cases
1.	Lower Segment C-Section	13
2.	Craniotomy	01
3.	Tracheostomy	07
4.	Orthopaedic	04
5.	Appendectomy	01
6.	I and D Debridement	04
Total		30

sumption. So working under such conditions along with a fear of cross contamination was a big challenge. COVID-19 patients undergoing surgery are at increased risk of developing post operative complications[12] due to underlying chest infections, any comorbid and decreased immunity which can result in post op pneumonia, delayed wound healing, myocardial infarction and even death. This would prolong recovery and stay in the hospital thus increasing work load. Overall this unique situation increased the work load for multiple disciplines including Intensivists, Epidemiologists, Hygienists, anaesthetists. However anesthetists are at higher risk than healthcare worker of other specialities, while performing emergency airway intubation inside and outside OT, while taking care of critically ill patients in ICUs and while providing peri-op care of patients during surgery[13].

Infectious Waste Disposal

The contaminated and infectious material was disposed off in a double layered plastic bag in a labeled COVID 19 container[14] and it was ensured that there was no tear or leak in the bag done by a dedicated staff wearing PPE. This plastic bag was sealed and sprayed with 1% hypochlotire solution was then taken by the dedicated trolley for inceneration. The labeled container after removal of plastic bag was disinfected each time with hypochlorite solution[15].

Staff Surveillance

PCR of every individual in a team who carried out the surgery was sent on 5th day after exposure as the incubation period of corona virus is 5 to 6 days[16]. If anybody tested positive was admitted and monitored. 30 surgeries were conducted in operation theater, Out of all exposed individuals only 2 got infected who were directly involved in patient care.

Psychological Effects

We have assessed that initially there was a fear of cross contamination in operation theater staff including doctors[17] but with time they overcame this fear and we found all of them in good mental health. We also observed depression among patients of being infected with COVID-19[18] over and above they are undergoing surgery. We counseled them during preanaesthesia assessment and reassured prior to surgery as well because good mental health of patient is must for early recovery.

CONCLUSION

Case selection should be restricted to emergency/nondeferrable surgery by instituting precise well established protocols of damage control surgery. Clear communication should be maintained with surgeon. Hospitals must prepare stringent and meticulous protocols to be followed to prevent intra-hospital cross infection. Adequate teaching/training of donning and doffing should be ensured. Infact it is not just PPE; rather it is strict adherence and vigilance to follow universal principle of infection control and prevention at all the times.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

REFERENCES

1. Li Q, Guan x, Wu P, Wang X , Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel corona virus-infected pneumonia. N Engl J Med 2020; 382(13): 1199-1207.
2. Waris A, Atta UK, Ali M, Asmat A, Baset A. COVID-19 outbreak: current scenario of Pakistan. New Microbes New Infect 2020; 35: 100681.
3. Myles PS, Maswime S. Mitigating the risks of surgery during the COVID-19 pandemic. Lancet 2020; 396(10243): 2-3.
4. Flemming S, Hankir M, Ernestus RI, Seyfried F, Germer CT, Meybohm P, et al. Surgery in times of COVID-19 - recommendations for hospital and patient management. Langenbeck's Arch Surg 2020; 405(3): 359-64.
5. Tan Z, Phoon PHY, Zeng LA, Lim XT, Loh KWT, Goh MH. Response and operating room prepration for the COVID-19 outbreak: A prespective from the national heart centre in Singapore. J Cardiothorac Vasc Anesth 2020; 34(9): 2331-37.
6. Coccolini F, Perrone G, Chiarugi M, Marzo FD, Ansaloni L, Scandroglio I, et al. Surgery in COVID-19 patients: Operational directives. World J Emerg Surg 2020; 15(1): 25.
7. Hirschmann MT, Hart A, Henckel J, Sadoghi P, Seil R, Mouton C. COVID-19 coronavirus: recommended personal protective equipment for the orthopaedic and trauma surgeon. Knee Surg Sport Tr A 2020; 28(6): 1690-98.
8. Grelat M, Pommier B, Ported S, Amelot A, Barrey C, Leroy HA, et al. Patients with corona virus 2019 (COVID-19) and surgery: Guidelines and checklist proposal. World Neurosurg 2020; 139(1): 769-73.
9. Macfarlane AJR, Griffiths WH, Pawa A. Regional anaesthesia and COVID-19: first choice at last?. Br J Anaesth 2020; 125(3): 243-47.

10. Trevisanuto D, Moschino L, Doglioni N, Roehr CC, Gervasi MT. Neonatal resuscitation where the mother has a sus-pected or confirmed novel corona virus (SARS-CoB-2) infection: Suggestion for a pragmatic action plan. Neonatol 2020; 117(1): 133-40.
11. Ti LK, Ang LS, Foong TW, Wei BS. What we do when a COVID-19 patient needs an operation:operating room prepration and guidance. Can J Anaesth 2020; 67(6): 3251.
12. Nepogediev D, Bhangu A, Glasbey JC, Li E, Omar OM, Simoes JFF, et al. Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection:an international cohort study. Lancet 2020; 396(10243): 27-38.
13. Bashir MA. Novel coronavirus (COVID-19): Its implications for anaesthesia. Anaesth Crit Care Pa 2020; 24(1): 1-3.
14. Peng J, Wu X, Wang R , Li C, Zhang Q, Wei De. Medical waste management practice during the 2019-2020 novel coronavirus pandemic: experience in a general hospital. Am J Infect Control 2020; 48(8): 918-21.
15. Rutala WA, Weber DJ. Uses of inorganic hypochlorite (bleech) in health-care facilities. Clin Microbiol Rev 1997; 10(4): 597-610.
16. Lauser SA, Grantz KH, Bi Q, Jones FK, Zheng Q, Meredith HR, et al. Estimated incubation period of COVID-19. Am Coll Cardiol 2020; 172(9): 577-82.
17. Lishan H, Lin G, Tang L, Yu L, Zhou Z. Special attention to nurses protection during the COVID -19 epidemic. Crit care, Bio Med Center 2020; 24(1): 120.
18. Nobels J, Martin F, Dawson S, Moran P, Savovic J. The potential impact of COVID-19 on mental health outcomes and the implications for service solutions. National Institute of Health Research 2020 [Internet] Available from: https://arc-w.nihr.ac.uk/research-and-implementation/covid-19-response/potential-impact-of-covid-19-on-mental-health-outcomes-and-the-implications-for-service-solutions/