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Operating Room Management in the Pandemic Era

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Abstract

The pandemic in Indonesia has been declared a non-natural national disaster since March 13. 2020(MOH, 2020). As health workers working in the operating room, they must prioritize safety principles to be able to provide the best service in the era of the COVID-19 pandemic. During the COVID-19 pandemic, the standard of hospital room facilities must be a concern so that there is no transmission from patients. The operating room needs to be designed to have the right placement, as well as the right room and equipment design, in order to create a service flow that protects hospital staff and families/communities who come for patients. Appropriate facility standards must be prepared by hospital management so that patient care can be carried out properly. This article aims to discuss good forensic and operating room service standards, and explore options for providing operating rooms for type C and D hospitals or mobile hospitals.

Keywords
operating room management; Covid 19; pandemic covid

I. Introduction

The world declared COVID-19 as a pandemic was on March 11, 2020 (Rodrigues-Pinto, Sousa and Oliveira, 2020). Meanwhile in Indonesia the announcement of COVID-19 as a non-natural national disaster is on March 13, 2020(MOH, 2020). Currently in Indonesia there are 3,496,700 people infected with the corona virus, with 98,889 patients dying(COVID-19, 2021a). The operating room is a requirement for all hospitals when evaluating the feasibility of a hospital in obtaining an operational permit. Mortuaries and forensic service rooms are health facilities that require special attention in planning, construction, operation, and maintenance, especially during the COVID-19 pandemic. or in handling other infectious diseases in hospitals (RS). Good management of forensic and mortuary services is expected to complement the governance.

The world health agency (WHO) has also announced that the corona virus, also called COVID-19, is a global threat worldwide. The outbreak of this virus has an impact especially on the economy of a nation and globally. These unforeseen circumstances automatically revised a scenario that was arranged in predicting an increase in the global economy. (Ningrum, P. et al. 2020)

The Covid-19 pandemic caused everyone to behave beyond normal limits as usual. One of the behaviors that can change is deciding the decision to choose a college. The problem that occurs in private universities during covid 19 is the decrease in the number of prospective students who come to campus to get information or register directly to choose the department they want. (Sihombing, E and Nasib, 2020)

II. Review of Literature

2.1. Main Text/Discussion

The current COVID-19 pandemic must prioritize financial and human resources effectively. Maintaining health workers is a very important element. Efforts are being made to minimize the spread of viral infections among surgeons and other specialists. Although surgeons are not directly dealing with the pandemic, two factors are worth considering:

1. Surgeons may be exposed to COVID-19 infection while in the operating room
2. The period of training or college for a surgeon is quite long. Thus, changing surgeons is difficult.(Coccolini et al., 2020).

In Indonesia, according to the distribution map, there are 3,496,700 confirmed, 524,142 active cases, with a total of 26,858,020 specimens examined and a total of 18,234,02 people examined. (COVID-19, 2021b)

2.2. When is the Operation Performed?

In this pandemic era, to be able to perform surgical services, there must be a certain quota / quota(Aurora Pryor, 2020). The screening process is important for carrying out operations in the pandemic era. The following are things that must be considered for surgical patients for areas with high transmission:

1. All patients must be screened for symptoms of Covid-19
2. All patients should undergo PCR testing (unreliable antibody tests are used). In certain areas, the antigen tar is still relevant.
3. If the patient who will undergo elective surgery, the operation is postponed until the patient recovers.

For areas with low transmission

1. All patients must be screened for symptoms of covid-19
2. All patients who have symptoms, are referred for further examination(ASA and APSF, 2021)

Things that must be considered by health workers when in the operating room:

1. There is a possibility of spreading the virus during open, laparoscopic and robotic surgery
2. Must pay attention to aerosol particles produced
3. There is a possible increased risk of viral travel

Health protocols for surgeons and staff need to be updated to ensure safety in the operating room in preventing the spread of the coronavirus. Not only in the operating room but outside the room and transmission between personnel is also considered.

2.3. Where is the Surgery?

The main operating room must have more than 25 air exchange cycles per hour. Airflow in the operating room is very important to minimize the risk of exposure to viral infections. Operating rooms are usually designed to have positive pressure to prevent intraoperative contamination. The corona virus is 125 nm in diameter and most of these particles can be captured by a High Efficiency Particulate Air (HEPA) filter. It can also be combined with high-frequency air exchange to reduce the possibility of further spreading of the corona virus(Fehr and Perlman, 2015; Perry, Agui and Vijayakimar, 2016; Coccolini et al., 2020).

The zones in the operating room are divided into 5 zones which are shown in Table 1. This is to ensure the regularity of the process in reducing the spread of the virus (Pinto RP, 2020).

Table 1

Zone 1	Entrance area, where basic PPE is worn
Zone 2	The vestibule where the disinfection and operation takes place
Zone 3	COVID-19 room
Zone 4	Exit room, where PPE is removed
Zone 5	Get out of the locker room, where the health workers take a shower

2.4. Surgeons and Staff

In zone 1, surgeons and staff must wear disposable surgical scrubs, waterproof boots and waterproof aprons. for the hands must be smeared with water and chlorherxidine gluconate(Pinto RP, 2020). Health workers must use N95 or FPP 2 masks as recommended by the Centers for Disease Control and Prevention because these masks are believed to be effective in preventing the incoming corona virus.(CDC, 2020). In zone 2 health workers must use a hazmat, surgical equipment is also sterilized with alcohol, gloves (handscoons), followed by a sterile surgical scrub suit and a second pair of gloves(Pinto RP, 2020). Surgical gown (AAMI) [association of the advancement of medical instrumentation] level 3 (usually found in the operating room) or clothing recommended for surgical procedures. Hair protectors/surgical caps must be worn according to protocol, which uses straps to be worn around the head and neck(Awad et al., 2020). Boots must be waterproof and using double gloves is recommended. After the operation, the health workers go out to zone 4 where the doffing is done. And in zone 5 PPE is removed and health workers are recommended to take a shower. Strict screening for health workers is very important. Health workers who are exposed to the corona virus are expected to report immediately if symptoms occur and must be temporarily dismissed from work. In addition, all contacts (patients and colleagues) must be traced and infection control measures taken quickly.

2.5. Anesthesia Protocol

Anesthetists with experience in intubation recommend that the operating room have a Heater and Moisture Exchanger (HME) to filter the expiratory circuit. Soda-lime and filters are used after completing one patient/case and airway devices are disposable(Peng, Ho and Hota, 2020). Airway devices, face mask ventilation and open airway filters should be minimized. If the patient is transferred directly from the Intensive Care Unit (ICU) special ventilation must be used. To reduce the risk of aerosolization, the gas flow should be shut off and the endotracheal tube clamped with forceps when switching from a portable device to a ventilator(Ti et al., 2020). Regional anesthesia is recommended. Oxygen placed in the nose should be administered under a surgical mask. Antibiotics should be used to reduce postoperative vomiting.

If the patient is in the ICU and is being intubated, the patient must also comply with the health protocol, namely using N95 masks, PPE, gowns, eye protection and hats/hair protection to avoid exposure to the virus from the anesthesia staff/team.(Firstenberg et al., 2020).

2.6. Transfer Protocol (Move)

The transfer from the ward to the OR will be carried out by ward nurses, of course nurses are equipped with personal protective equipment (PPE), N95 masks, protective glasses, face shields, waterproof gowns and waterproof boots. for patients from the ICU, must be provided with a portable / special ventilator. To avoid aerosolization, the gas flow is turned off and the endotracheal tube is clamped with forceps(Ti et al., 2020). Use of a portable/specialized ventilator with a High-Efficiency Particulate Air (HEPA) filter placed between the endotracheal tube – circuit.

III. Research Method

This research is a case study by looking at the operating room situation. The critical review is based on the lack of operating room management during the current pandemic. Therefore, proper operating room management is needed so that patients can be calm when performing surgery.

IV. Result and Discussion

4.1. Intraoperative Protocol

Surgeons and staff who have no need for intubation should stay out of the operating room until induction of anesthesia and intubation are complete (American College of Surgeons, 2020). Patients with asymptomatic numbers are quite large and the operating room may be a place for virus transmission.

A recent Canadian study described a modification of PPE used in health protocols to treat COVID-19 patients (Lockhart et al., 2020). Spread of aerosolized respiratory secretions and contamination were visualized with commercial powder products and ultraviolet light. This shows the amount of contamination on the neck, base of the wrist, bottom pants and shoes. Aerosols are shown to spread from 5 to 7 m during Orthopedic surgery. Hip surgery can cause aerosol spread from 8 to 9 m (Nogler et al., 2001). In the operating room, the number of health personnel who take part must be as effective as possible.

In orthopedic surgical procedures, the use of electric tools, such as electrocautery, reamers and drills, allows aerosols to spread that can spread the virus (Ti et al., 2020). Because of this, its use should be reduced to a minimum and power settings should be as low as possible (Yeh et al., 2010).

Disposable medical equipment and all body fluids, blood secretions, pathological specimens should be disposed of in double sealed bags. The specimen must be placed in a biohazard bag in the OR and then placed in another biohazard bag with the correct label, for example “Positive Covid” or “suspected covid” (Firstenberg et al., 2020).

Recent data show that COVID-19 can be transmitted indirectly from viral contamination on the surface of objects in the operating room where there are positive patients infected with the virus (Cai et al., 2020).

The incubation period for COVID-19 is around 4 days, research shows it can range from 2 to 14 days. People who have respiratory diseases should not donate blood because transmission of the virus can be through blood (Li et al., 2020). Theoretically, viremia in patients with asymptomatic or confirmed COVID-19 could pose a risk of transmission to healthcare workers during surgery via aerosolized blood.

The operating room should be disinfected during the operation. Staff who carry out disinfection enter the operating room after adequate air exchange, this is intended so that the infectious particles subside first (Awad et al., 2020). It is also important to understand that aerosols are mostly present in the operating room. Surgeons, ENT, Neurosurgery and Ophthalmologists are at higher risk of aerosol exposure (Hirschmann et al., 2020).

4.2. Recover

Operations that take a long time tend to have more postoperative complications. Surgeons, nurses and other staff are responsible for postoperative management, especially in monitoring patients' families and visitors to comply with health protocols. If it is necessary to do so, it is important to limit visitors. Most of the

Hospitals have also recently stopped visits from anyone (Awad et al., 2020). Additional steps are recommended, namely social distancing and the use of the latest technology such as inpatient telemedicine (Massey PA, 2020)

During a pandemic, surgeons and patients alike have difficulty managing a wide variety of injuries and conditions. Both need to balance optimal care of the patient's injury or condition (BOA, BSCOS and BSSH, 2020)

V. Conclusion

Surgeons and staff need to keep up to date with the latest literature on safety measures to be taken in the process of surgical procedures. This article can help increase the literature. This knowledge must develop as new information emerges. Infections or deaths of specialist staff must be minimized in order to maintain health personnel in the face of surgical and other emergencies.

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