



Emergency Operation in Dr Wahidin Sudirohusodo and Hasanuddin University Hospital during the COVID-19 Pandemic

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Abstract

BACKGROUND: In December 2019, the world was shocked by a respiratory infectious disease caused by the novel coronavirus which was later referred to as COVID-19. This virus is transmitted from human to human very quickly through droplets, aerosols, and direct contact with COVID-19 patients. One of the health services suspected of playing a role in the spread of this virus is surgery. Surgical procedures involve much medical personnel and direct contact with patients causes surgery to be considered. In addition, surgery is also prone to causing nosocomial infections because generally post-operative patients have an increased inflammatory process and decreased immune response. In contrast to elective surgery, emergency surgery has a higher risk of post-operative morbidity and mortality than elective surgery because of the limited time to prepare and assess the patient.

AIM: To find out the number of positive cases of COVID-19 after emergency surgery at our institution.

METHODS: The type of research conducted is descriptive where this study uses secondary data in the form of medical records of post-operative emergency patients who meet the inclusion and exclusion criteria.

RESULTS: A total of 741 medical records were obtained, with 691 of them being COVID-19 negative and 50 being COVID-19 positive.

CONCLUSION: We found 93.3% of negative post-operative COVID-19 cases and 6.7% of positive post-operative COVID-19 cases in patients underwent emergency surgery procedures.

Edited by: Slavica Hristomanova-Mitkovska
Citation: Warsinggih W, Dani MI, Syarifuddin E, Jafar PN, Faruk M. Emergency Operation in Dr Wahidin Sudirohusodo and Hasanuddin University Hospital during the COVID-19 Pandemic. Open-Access Maced J Med Sci. 2022 May 22; 10(E):971-974. https://doi.org/10.3889/oamjms.2022.9641
Keywords: COVID-19; Emergency surgery; Pandemic
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Received: 04-Apr-2022
Revised: 18-Apr-2022
Accepted: 12-May-2022
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Funding: This research did not receive any financial support
Competing Interest: The authors have declared that no competing interest exists
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Introduction

In the end of 2019, a new virus had been found and currently known as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). This virus was known to cause coronavirus disease 2019 or widely known as COVID-19 which became pandemic since February 11, 2020, declared by the World Health Organization [1], [2]. Since its first identification until May 15, 2020, more than 185 countries had been reporting COVID-19 case, more than 4,400,000 people were infected and 300,000 COVID-19 patients were dead [3]. Indonesia is also one of the countries with COVID-19 infection since March 2020. On September 24, 2020, 4634 new COVID-19 cases were reported with daily mortality incidence which was 128 [4]. Many areas in Indonesia became red zone during these times, especially in the hospital. A lot of doctors and paramedics became infected. According to Wang *et al.* (2020), 57 out of 138 cases were reported to be related with hospital contact and 40 of which were medical staff [5].

Health-care system should be aware of both emergency and elective surgical services in hospital. Surgical procedures involve many medical personnel and close contact with patients. Hence, health-care system should pay more attention to it because some surgical procedures can produce aerosols, such as laparoscopy and endoscopy which have the potential to infect both medical personnel and patients [6]. The operating theater is an area at risk for the transmission of the SARS-CoV-2 virus. A study in China found that 34 asymptomatic adult patients underwent elective surgery had symptoms of COVID-19 after surgery and confirmed to be COVID-19 using RT-PCR examination. The symptoms arised 2–6 days post-surgery. Hence, it can be concluded that surgical procedures might increase transmission and progression of COVID-19 [7].

Nosocomial infection or hospital-acquired infection is a factor that influences clinical outcome of hospitalized patients. To decrease the transmission, some preventive measures can be done such as frequent hand washing and personal hygiene [8]. Face mask and other PPE should be used by medical personnel within operating theater or when contact with

immunosuppressive patients to protect the patients. Moreover, patients with airborne infection must use face mask outside isolation room. Other preventive measures such as using disposable syringe only once and frequent sterilization of medical equipment should also be done [9].

Emergency surgery has a higher post-operative morbidity and mortality rate compared to elective surgery. This might be due to limited time for assessing and preparing patients such as pre-operative fasting and also other systemic diseases [10]. The surgical process is also susceptible to cause nosocomial infections because generally post-operative patients experience increased inflammation and decreased immune response [11].

With the presence of external factors, such as the risk of contracting surgical patients by SARS-CoV-2 through aerosols and direct contact within hospitals, accompanied by internal factors of patients undergoing emergency surgery such as decreased immune response and increased inflammation, patients who undergo emergency surgery have a higher risk of contracting COVID-19. Therefore, this study is needed to study the status of COVID-19 disease in patients undergoing emergency surgery at our institution.

Methods

Study design

This research was conducted using descriptive research methods with secondary data.

Study time and place

The study was conducted in May–June 2021 using medical record data from March–December 2020 at the Medical Record Installation of Dr. Wahidin Sudirohusodo Hospital and Hasanuddin University Hospital Makassar, South Sulawesi, Indonesia.

Samples

This research was conducted by collecting medical record data for emergency surgery patients at our institution during the COVID-19 pandemic for the March–December 2020 period. The inclusion criteria for this study were as follows: (i) All medical records of emergency surgery patients in March–December 2020 regardless of the patient's COVID-19 status before surgery and (ii) complete medical records. Meanwhile, the exclusion criteria for this study were as follows: (i) Unreadable medical records and (ii) incomplete data from the required variables.

Operational definition

Emergency surgery defined in this study was patients who underwent emergency surgery (surgeries that were not scheduled and could not be postponed due to life-threatening illness) at our institution during the COVID-19 pandemic in March–December 2020. The post-operative COVID-19 status of patients was measured through RT-PCR examination of nasopharyngeal and/or oropharyngeal swabs. The patient is declared negative or positive for COVID-19 according to the presence of SARS-CoV-2 in RT-PCR examination.

Data processing

After the medical records were collected, the data processed with Microsoft Office Excel applications for analysis. The data are presented in the form of descriptive, tables, and graphs.

Ethics

This research has obtained a research ethics permit from the Research Ethics Committee of the Faculty of Medicine, Hasanuddin University, with license number 132/UN4.6.4.5.31/PP36/2021.

Results

Table 1 and Figure 1 showed that from 741 patients that meet our inclusion criteria, 691 patients (93.3%) were negative for COVID-19 and 50 patients (6.9%) were positive for COVID-19.

Table 1: Emergency surgery COVID-19 cases in Dr. Wahidin Sudirohusodo Hospital

No.	COVID-19 status	Frequency	Percentage
1	Negative	691	93.3
2	Positive	50	6.7

All data were taken from Dr. Wahidin Sudirohusodo Hospital, because RT-PCR examination was not performed after surgery on Hasanuddin University Hospital.

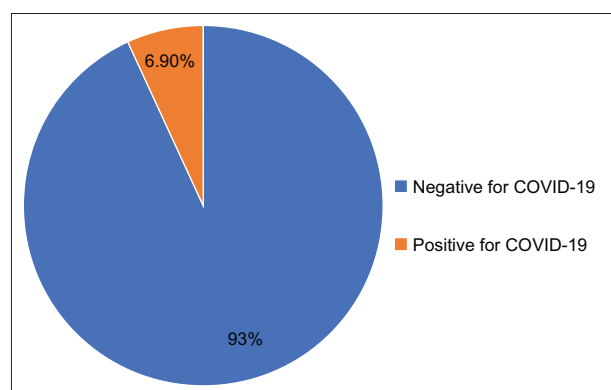


Figure 1: Post-emergency surgery COVID-19 cases in Dr. Wahidin Sudirohusodo Hospital

Discussion

COVID-19 is a respiratory infectious disease caused by SARS-CoV-2 virus. The transmission of this virus is through: (i) Droplet from infected patients that come out when they cough or sneeze, (ii) aerosol, and (iii) airborne. Moreover, a direct contact with both symptomatic and asymptomatic patients can also transmit SARS-CoV-2 [12], [13].

Some surgical procedures produce aerosol such as laparoscopic and endoscopic procedures. Hence, it is potentially infect medical personnel [6]. A study by Gusti *et al.* in China found that post-surgery patients showed symptoms of COVID-19 and confirmed positive for COVID-19 though RT-PCR examination. According to Potter *et al.*, surgery is prone to cause nosocomial infections, especially emergency surgery, because in general, there is an increase in the inflammatory process and decreased immune response in post-operative patients, making them susceptible to severe pneumonia and other respiratory pathogenic infections [11].

RT-PCR is a gold standard to diagnose COVID-19 with 95% specificity. Negative COVID-19 is the term used for patients whose RT-PCR results do not find any antigen from the SARS-CoV-2 virus. On the other hand, if the SARS-CoV-2 virus antigen is detected on a RT-PCR examination, the patient is declared to have COVID-19 [12], [14].

Data were obtained from Dr. Wahidin Sudirohusodo Hospital, Makassar, from 741 cases of emergency surgery in March–December 2020, there were 50 positive cases of COVID-19 with a percentage of 6.7%. Based on these data, it can be concluded that risk of being infected with COVID-19 in post-operative emergency patients at Dr. Wahidin Sudirohusodo Hospital is very small. This is similar to the study of Manuia *et al.* who conducted a study of 207 emergency surgery patients at Danbury Hospital and Norwalk Hospital, 4 patients (1.9%) had symptoms of COVID-19 post-surgery [15].

In addition, based on the results of research conducted, 50 cases of COVID-19 were found in patients who had undergone various emergency surgical procedures. The result of this study is similar to the research conducted on 164 patients who underwent emergency surgery at the Zhongnan Hospital of Wuhan, the results were that around 54 patients were confirmed positive for COVID-19 after undergoing emergency surgical procedures with a distribution of 29 patients after cesarean section, seven hepatobiliary surgery patients, seven neurologic surgery patients, four gastrointestinal surgery patients, three urological surgery patients, two orthopedic surgery patients, and two cardiothoracic surgery patients [16]. Furthermore, Nahshon *et al.* reported a study examining three non-COVID-19 surgical patients in Iran with different

procedures (cholecystectomy, hernia repair, and hysterectomy), after undergoing surgical procedures, all patients had COVID-19 symptoms. After the RT-PCR examination, two of the three patients were positive for COVID-19 [17]. Another study conducted by Shaoqing *et al.* with 34 patients undergoing elective surgery during the COVID-19 pandemic, it was found that all patients suffered postoperative COVID-19 [18].

A study was conducted to find out whether operating theater has high incidence of COVID-19. From the results of this study, it was found that the operating theater had a lower risk for the spread of the SARS-CoV-2 virus than community contacts. In general, post-operative COVID-19 cases were found in hospitalized patients. Together with length of stay of the patients, these factors could be associated with the incidence of nosocomial infections in hospitalized patients. This is in accordance with several studies which state that there is a significant relationship between nosocomial infections from both COVID-19 patients and hospital staffs. Supported by a study conducted at Zhongnan Hospital, one patient was admitted to the surgical department after experiencing abdominal pain. This patient was thought to have infected more than ten health care personnel in this department. Patient-to-patient transmission was also suspected, and at least four hospitalized patients in the same ward were infected with COVID-19, all of whom had abnormal gastrointestinal symptoms [19].

Based on the findings of this study, the authors suggest that hospitals and health workers should pay more attention to health protocols during the COVID-19 pandemic as an effort to reduce the incidence of post-operative COVID-19 cases. In addition, the public is expected to comply with health protocols, especially when visiting hospitals to reduce the risk of COVID-19 transmission. Further research is needed considering the lack of information obtained by the authors when compiling reports with more specific research variables.

Conclusion

We found 93.3% of negative post-operative COVID-19 cases and 6.7% of positive post-operative COVID-19 cases in patients underwent emergency surgery procedures.

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