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Cardiopulmonary Resuscitation (CPR) during COVID-19 Pandemic

Aprianto Daniel Pailaha[1*]

1. Professional Nurse Study Program, Department of Nursing, Faculty of Health Sciences, Brawijaya University, Malang, Indonesia

* Corresponding Author: Ns. Aprianto Daniel Pailaha, S.Kep., Professional Nurse Study Program, Department of Nursing, Faculty of Health Sciences, Brawijaya University, Malang, Indonesia. Email: apriantodanielpp@gmail.com

ORCHID ID: https://orcid.org/0000-0002-9456-6616

Commentary

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ABSTRACT

Introduction: The COVID-19 infection has a high rate of mortality and morbidity and is extremely contagious. COVID-19 has raised attention to safety issues involving healthcare workers who perform CPR. The risk of transmission produces a dilemma to perform cardiopulmonary resuscitation (CPR) within the COVID-19 pandemic. Additionally, patient and/or family preferences, as a factor associated with Do-Not-Resuscitate (DNR). This commentary wants to provide an overview or other perspectives that may be the subject of further research so that there will be evidence base practice for health workers, especially nurses in code blue situations.

Discussion: COVID-19 pandemic has clearly had a significant impact on the epidemiology and outcome of cardiac arrest in both out-of-hospital and in-hospital settings. All potential COVID-19 patients should be offered the advantage of CPR by attempting to revive them after taking all required safety precautions, and the patient should only be confirmed dead after CPR has been performed. Provision of further information regarding CPR to patients and/or families for consideration, including the advantages and disadvantages of CPR, before making a final decision regarding the administration of CPR. COVID-19 patients with a poor prognosis might benefit from Do-Not-Resuscitate (DNR) but this is causes dilemmas in nursing profession.

Conclusion: Although the survival rate for COVID-19 patients is poor, it is anticipated that CPR attempts will still be performed during the COVID-19 pandemic by following several guidelines. COVID-19 patients with a poor prognosis might benefit from Do-Not-Resuscitate (DNR) if the patient and/or family who are accountable provide their approval and everything is in order. As a nurse, we must respect the decisions that patients or families make because it is their right and their authority.

Keywords: CPR; Cardiac Arrest; DNR; COVID-19; Nursing

INTRODUCTION

The COVID-19 pandemic is extremely challenging health care systems worldwide and increasing principal ethical issues, especially concerning a prospect need for health care in the context of scarce resources and crisis capacity. Cardiac arrest is defined as the sudden cessation of cardiac mechanical activity, confirmed by the absence of signs of circulation. Lack of blood flow to the brain and other vital organs can cause loss of consciousness, powerlessness, or death if not treated properly [1]. Cardiac arrest is associated with pneumonia in COVID-19 patients, myocardial injury has a poor percentage of outcomes, whereas other Cardiovascular Disease (CVD) cases without myocardial injury are relatively vulnerable [1,2]. The COVID-19 patients may experience respiratory dysfunction and a subsequent change in tissue oxygenation that directly affects the cardiovascular system and results in serious issues including myocarditis, myocardial injuries, acute myocardial infarction, heart failure, cardiac dysrhythmia, and thromboembolism [3]. COVID-19 infection has a high mortality and morbidity rate and is highly contagious. COVID-19 has raised attention to safety issues involving healthcare workers attempting CPR. Among the several aerosol-producing procedures performed on patients, CPR is strongly associated with a variety of aerosol-generating procedures, including chest compression, positive pressure ventilation, and the respiratory tract maneuver. This will trigger extremely concerned about being infected with COVID-19 because considering that the COVID-19 virus is very dangerous for vulnerable populations.

Several inpatients experiencing cardiac arrest are administered cardiopulmonary resuscitation (CPR), provided advance instructions are available or the patient has a documented Do-Not-Resuscitate (DNR) status [4]. Despite the fact that attitudes regarding CPR have changed due to the COVID-19 pandemic, the majority of respondents reported that they would be prepared to do CPR if they encountered a cardiac arrest incident. Notably, independent of usual circumstances, people are more inclined to perform CPR without mouth-to-mouth resuscitation. There were other factors that affected CPR during the COVID-19 pandemic, however the two of that had been determined to be of

considerable increasing significance were the fear of contracting COVID-19 and the fear of spreading COVID-19 to others, which were assessed at 78% and 29%, respectively [5,6]. This is a separate consideration for health workers, especially nurses in implementing CPR in cases of cardiac arrest during the COVID-19 pandemic.

When a new pandemic begins, the infection in healthcare facilities spreads easily. In April 2020, as many as 22,073 cases of COVID-19 among healthcare professionals were reported to the WHO. On February 2020, there were 1716 healthcare professionals in China who had contracted SARS-CoV-2. As many as 3300 people were infected as of early March, and at least 22 of them died in China. As of March 2020, about 2600 people were infected in Italy, and 13 of them had died [7]. When performing CPR during the COVID-19 pandemic, there are several factors that need to be considered carefully to ensure the safety of the rescuers, the patients, and the surroundings. The purpose of writing comments on this article is to provide an opinion regarding the administration of CPR in cardiac arrest in patients with COVID-19 or during this COVID-19 pandemic.

The resuscitation guidelines, in force considering 2015, have consequently been adapted to this new situation, e.g., for Basic Life Support (BLS), mouth-to-mouth ventilation in addition to chest compression are encouraged to bystanders. For Advanced Life Support (ALS), bag-masks or Supraglottic Airway (SGA) ventilation are considered appropriate options to tracheal intubation [8]. Recently, updates have been issued, considerably with the aid of using the International Liaison Committee on Resuscitation (ILCOR), European Resuscitation Council (ERC), and the American Heart Association (AHA). Briefly, the principle modifications advise that lay rescuers have to consider chest compressions only, except for children, and all life support providers must use PPE all through resuscitation and favor early tracheal intubation to minimize aerosols.

The risk of transmission of the SARS-CoV-2 virus to initial responders performing cardiopulmonary resuscitation (CPR) produce a dilemmas to manage CPR within the COVID-19 pandemic. A better knowledge of this could enable identification of which individuals are less likely to benefit from CPR,

and inform discussion of a Do Not Resuscitate (DNR). This aims to provide an overview or other perspectives that may be the subject of further research so that there will be evidence base practice for health workers, especially nurses in code blue situations.

DISCUSSION

1. CPR and COVID-19 Additional Considerations

The new regulations for performing high-quality CPR during the COVID-19 pandemic have been introduced to lower the risk of COVID-19 transmission. In order, the American Heart Association (AHA), European Resuscitation Council (ERC), International Liaison Committee on Resuscitation (ILCOR), and other resuscitation associations have been released a modification guidelines or recommendations for the COVID-19 pandemic concerns into account [9-11]. Several modification and recommendation implemented since the COVID-19 pandemic:

1) International Liaison Committee on Resuscitation (ILCOR)

   Treatment recommendations from ILCOR for performing CPR to address cardiac arrest problems in patients with COVID-19 [12].

   a) Cardiopulmonary resuscitation and chest compressions may produce aerosol.
   b) Rescuers consider public-access defibrillation and compression-only.
   c) Rescuers who are committed, competent, and trained may choose to give children rescue breaths in addition to chest compressions (good practice statement).
   d) Should wear personal protection equipment during resuscitation
   e) Rescuers consider defibrillation before donning aerosol-generating personal protection equipment.

2) European Resuscitation Council (ERC)

The following new recommendation of Basic Life Support (BLS) are advised by the European Resuscitation Council for patients with confirmed or suspected COVID-19 [12,13].

a) Should have prior training in appropriate use of PPE
b) Consider to compression-only CPR if bag-mask ventilation is difficult or not available
c) Use a high-efficiency particulate air (HEPA) filter during bag-mask ventilation
d) Use two hands to hold the mask and the person doing compressions can squeeze the bag when they pause after 30 compressions
e) Use PPE (surgical mask, eye protection, apron, and gloves) before defibrillation because not an aerosol-generating procedure

3) American Heart Association (AHA)

The American Heart Association (AHA) introduced new recommendation for Basic Life Support (BLS) in COVID-19 patients both in-and out-of-hospital cardiac arrest [13].

a) Significantly reduce the risk of infection with vaccination and boosters.
b) CPR is considered to be an aerosol-generating procedure (AGP) such as hest compressions, defibrillation, bag-valve-mask (BVM) ventilation, intubation, and positive pressure ventilation.
c) Should wear PPE such as N95 mask, gloves, gown, eye protection, positive pressure ventilation.
d) PPE must be donned before performing components of resuscitation.

If patients have any signs and symptoms, bystanders should give defibrillation only and without chest compression unless they have PPE. As a result, the estimated death rates for CPR are extremely low, and the use of barriers such as PPE was strongly recommended to reduce the risk of COVID-19 transmission. Cardiopulmonary Resuscitation (CPR) attempts such as chest compression only and defibrillation only as procedures with an increased risk

of COVID-19 transmission. Tracheal intubation and mouth-to-mouth or mouth-to-mask ventilation were associated with a high risk of COVID-19 transmission. Although previous research has shown that compression-only CPR is as effective as combined compressions and ventilations, this could not be the case for COVID-19 patients because they suffer from primary respiratory failure.

The European Resuscitation Council (ERC) COVID-19 guidelines encourage continuing resuscitation efforts for cardiac arrests that occur both inside and outside of hospitals while also attempting to reduce risk to the person providing treatment. The COVID-19 guidelines focus specifically on patients with COVID-19. Those providing treatment should conduct a dynamic risk assessment, which may include current COVID-19 prevalence, the patient's presentation, the probability that treatment will be effective and efficient, the accessibility of personal protective equipment (PPE), and personal risks for those providing treatment [14]. The proportion of patients with shockable rhythms decreased, as did the use of automated external defibrillators. The use of supraglottic airways increased, while the rate of intubation decreased. Overall, there was a increase rates return of spontaneous circulation, survival to admission, and survival to discharge.

2. CPR Outcomes during COVID-19 Pandemic

According to recent research, in-hospital cardiac arrest (IHCA) among COVID-19 patients was 9.39%, with 9% ROSC and 2% survival to hospital discharge. Accordingly, the average rate of out-of-hospital cardiac arrest (OHCA) survival to discharge is 8.8% [15]. But among COVID-19 patients, two more investigations on both in- and out-of-hospital CA showed a 0% survival rate to hospital discharge rate [16,17]. The primary CPR success rate among COVID-19 patients was low, especially for those with asystole or bradycardia [3,18]. This harmful infection has influenced the CPR efficacy because there are additional considerations

for the CPR attempt. Therefore, the COVID-19 pandemic has largely influenced CPR procedures. Apart from the various factors involved in performing CPR, another thing that must be considered is the ability and capability to perform CPR through training [19]. Participation in training such as Basic Trauma Cardiac Life Support (BTCLS) or Advanced Cardiac Life Support (ACLS) will help nurses gain more knowledge, experience, and skills when it comes to performing CPR on cardiac arrest patients.

Continuous cardiopulmonary resuscitation (CPR) training and quality control systems, such as monitoring morbidity and mortality, are also recommended [20]. Every nurse, especially those working in emergency room, needs to have the necessary training to administer first aid in accordance with protocol. As a result, nurses may feel more confident and competent to provide CPR in situations of cardiac arrest.

Data from in-hospital cardiac arrests caused by COVID-19 are less commonly reported. According to a multicenter cohort study from 68 Intensive Care Units in the United States found that 14.0% (701/5019) of patients had an in-hospital cardiac arrest, 57.1% (400/701) received CPR, and 7.0% (28/400) survived to hospital discharge with normal or mildly impaired neurological status [21]. According to data from 136 patients in China, about 113 (83.1%) of them required CPR, and ROSC occurred in 18 (13.2%) of the patients, 4 (2.9%) survived for at least 30 days, and one patient had a favorable neurological outcome at 30 days [22]. COVID-19 pandemic has clearly had a significant impact on the epidemiology and outcome of cardiac arrest in both out-of-hospital and in-hospital settings.

3. Nursing Decision-Making

Nursing is patient-centered care. A nursing profession requires to follow an ethical code, which allowed to provide great nursing care. Therefore, the nursing profession intends to maintain and improve health care in society. The key point is that a lower survival rate in CPR

was reported at the start of the COVID-19 pandemic compared to previous years. All intervention decisions must involve informed and involved patients and/or families, according to national and institutional policy [23]. However, patient and/or family preferences, as a factor associated with Do-Not-Resuscitate (DNR). Provision of further information regarding CPR to patients and/or families for consideration, including the advantages and disadvantages of CPR, before making a final decision regarding the administration of CPR.

It is critical for determine personal goals and preferences regarding a resuscitation attempt. The mortality rate for COVID-19 patients who seemed to be critically ill was significant and increased with age, comorbidities, and symptom severity. The AHA recommends taking these considerations into account when weighing the risk versus the benefit of initiating resuscitation. Furthermore, many different institutions have strongly advised patients with poor prognoses to consider DNR. When considering DNR, COVID-19 positivity by itself cannot be a factor except when it is accompanied by irreversible multi-organ dysfunction [16,24]. All potential COVID-19 patients should be offered the advantage of CPR by attempting to revive them after taking all required safety precautions, and the patient should only be confirmed dead after CPR has been performed. The statement emphasized the need for all professionals to consider every cardiac arrest victim who presents to the emergency room as a possible COVID-19 suspect during the pandemic and to wear the proper PPE. The CPR method should be performed with the fewest number of essential medical professionals present, ideally in a single-person room with the door closed.

It is noteworthy that CPR, in some cases, has been initiated by nurses, but the decision-making process for non-resuscitation is made by the physician and based on the discussion between the all-team members, considers not being useful the CPR maneuvers for some cases. It depends on the nurse, among other actions, the functionality of the stop cart, with availability of materials necessary for this type of assistance, technical procedures for venipuncture,

preparation and administration of medications, supervision of the technical professionals of the nursing team and possible relay in resuscitation maneuvers.

4. Ethical Approaches and DNR

The reality requires reflection with a professional ethical focus on the duty of updating professionals, as provided for in the Code of Ethics for Nursing Professionals, and which determines that the patient has the right to get preserve of correct information, to be heard in their needs, and to get preserve of resolute humanized care. These conclusions are based on bioethical reflection and acknowledgement that not all nurses working in palliative care for COVID-19 patients with DNR are able to provide communication that supports this choice, either by acting in accordance with protocol or by providing nursing care without considering or updating the practice of euthanasia. In this situation, struggling to take into consideration the knowledge of those involved or neglecting to listen to the patient and family interferes with their ability to communicate effectively and their autonomy, leading to conflicts and challenges in the management of nursing care.

According to qualitative research, in Maryland there are 31 nurses who worked for COVID-19 patients in the acute care units, in depth-interview the nurse mentioned that “They really push that DNR and that’s like a part of my distress, because I know I’m very patient-family centered in my thinking…because it’s futile they tell the family this person should be DNR. They’re over 70, we’re not going to escalate care…The family has to believe whatever we tell them…so hopefully they’re right, because they don’t have a choice, the family or the patient.[25]” Knowing the DNR order causes the nurse to experience moral distress. Rather than enhancing services, prepare for end-of-life care is something that is very difficult. Of course, as a nurse, you want to do the best for patients and their families, but not in the event of a DNR, because It is the patient and family's authority. Besides, disagreement about the

proper use of end-of-life care is one of the triggers of moral distress when providers encourage families to do DNR.

According to qualitative research, in Philippines there are 12 nurses who worked in COVID-19 ward of several hospitals, the nurse mentioned that “Occasionally, family members decide against intubation because they do not wish to witness their family member suffer further and add to the agony of the patient [26].” Severe symptoms of COVID-19 prompt families to put their loved ones out of the misery and sign DNR forms. In this case, nurses support symptom-free death and suffering reduction through assisting patients and families.

According to qualitative research, in United States there are 7 ICU nurses, in interview session the nurse mentioned that "Patient was a DNR or DNI maxed out on BiPAP (bilevel positive airway pressure support) and developed respiratory arrest. I, the nurse, and the intensivist thoroughly explained the situation to the family and encouraged transition to comfort care, yet the family refused. The patient suffered for another day and a half before she died. I was furious at the family and heartbroken for the patient, she deserved a more dignified death than she received [27].” The nurse was not explicit use term “moral distress” but describe about condition when they experienced moral-constraint distress because they perceived the life-sustaining treatments provided were contrary to the patient’s wishes and contributing to the patient’s suffering because they were constrained by a DNR order. Surrogate decision-making are not reflect the fully patient’s wishes.

Evidence has emerged illustrating ethical dilemmas in conducting DNR discussions during the COVID-19 pandemic [28]. Based on some of the qualitative research findings in several countries, it shows that DNR status causes moral distress due to opposition, and disagreement about DNR. Moreover, nurses have to support symptom-free death and suffering reduction for patients and their families. Additionally, nurses believe that the DNR is not in line with the patient's intentions and that the surrogate decision-making certainly does

not properly represent the patient's preferences. Some of the responses given by nurses depend on the assessment of the ethics held. This can be considered valid or correct if it is based on strong evidence.

CONCLUSIONS

Even when cardiopulmonary resuscitation is administered, cardiac arrest is common in critically ill COVID-19 patients and is associated with poor survival. COVID-19 patients with a poor prognosis might benefit from Do-Not-Resuscitate (DNR) if the patient and/or family who are accountable provide their approval and everything is in order. In fact, CPR efforts are still possible if there is a chance of surviving the patient. Although the survival rate for COVID-19 patients is poor, it is anticipated that CPR attempts will still be performed during the COVID-19 pandemic by following several guidelines in order to help people COVID-19 patients to survive using the American Heart Association (AHA), European Resuscitation Council (ERC), International Liaison Committee on Resuscitation (ILCOR), and other resuscitation associations modification guidelines or recommendations for the COVID-19 pandemic. However, patient and/or family preferences, as a factor associated with Do-Not-Resuscitate (DNR) in several cardiac arrest conditions. Nursing profession have to reflection and uphold ethical as provided for in the Code of Ethics for Nursing Professionals. DNR status causes moral distress due to opposition, and disagreement. Surrogate decision-making certainly does not properly represent the patient's preferences. As nurse, we have to support symptom-free death and suffering reduction for patients and their families, and respect the decisions that patients or families make because it is their right and their authority.

CONFLICT OF INTERESTS DISCLOSURE

The author declares that there is no conflict of interests

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Not applicable

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