REVIEW

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Adult Basic Life Support Practices During the COVID-19 Pandemic Period

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ABSTRACT

Coronavirus disease 2019 (COVID-19), a global epidemic, has been spreading rapidly all over the world since December 2019. Contamination can be caused by the penetration of respiratory droplets into the mouth, nose or eyes of people or by contact of the hands with the mouth, nose or eyes after touching surfaces where respiratory droplets adhere. Shortness of breath, high fever, dry cough, and loss of the sense of taste and smell are common symptoms in patients. Basic life support applied in cardiac arrest increases the survival chance of these patient. However, during the COVID-19 pandemic period, it is known that patients, rescuers and healthcare workers are at risk during basic life support applications due to the contagiousness of the virus. Due to all of these, basic life support guidelines have been updated and some applications that emphasize the safety of rescuers have been made. In this study, changes for basic life support to be applied in patients with a diagnosis of COVID-19 or with high suspicion of COVID-19 who developed cardiac arrest were discussed.

Keywords: COVID-19, cardiac arrest, basic life support

INTRODUCTION

In December 2019, an increase in pneumonia cases of unknown cause began to be seen in Wuhan, in China's Hubei Province. On January 7, 2020, it was revealed that this situation was a new type of coronavirus and it developed as a result of human-to-human transmission.[1] The new virus was named Severe Acute Respiratory Syndrome (SARS) Coronavirus 2 (SARS-CoV-2) due to its similarity to SARS Coronavirus (SARS-CoV), which is the agent of Acute Respiratory Syndrome (The Severe Acute Respiratory Syndrome, SARS). This newly formed disease, where the virus is the causative pathogen, was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020.[2,3] Coronavirus disease 2019 (COVID-19), which spread rapidly around the world, infected more than 44.5 million people in total and caused more than 1.1 million deaths, according to the data as of October 30, 2020. These numbers still continue to increase.[4]

The virus can be transmitted when respiratory droplets emitted from sick people enter the mouth, nose or eyes of others or after touching surfaces where respiratory droplets are present and subsequently touching the mouth, nose or eyes. Contact with secretions that can pass from the sick person has an important place in the contamination of the virus.[5,6] Since viruses can be detected in the respiratory secretions of asymptomatic patients, these people can also be contagious. Although the duration of contagion is not known, it is thought that it starts 1–2 days before the symptomatic period and ends with the disappearance of symptoms. In general, the incubation period varies between 2–14 days, while the median incubation period is 4.8 days.[5,7]

The COVID-19 infection is seen with many different symptoms. The most common symptoms are; shortness of breath, fever and dry cough. Apart from this, headache and sore throat, extreme weakness, loss of appetite, loss of taste and smell and diarrhea are seen. In severe cases, pneumonia, severe acute respiratory infection, kidney failure, and even death may occur.[5] Hypoxemic respiratory failure due to acute respiratory infection, ventricular arrhythmias, myocardial damage and shock are common in critically ill COVID-19 patients, making these

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patients susceptible to developing cardiac arrest.[8] During the COVID-19 pandemic, it was determined that cardiac arrest cases increased 58% in the Lombardy region of Italy, and 77% of these cardiac arrest cases were confirmed or suspected of being positive COVID-19 cases.[9] In Paris and the surrounding suburbs, it was stated that the incidence of cardiac arrest increased by two times in parallel with the increase in the number of admissions to hospitals due to COVID-19.[10]

Cardiac arrest is the cessation of cardiac functions, or the inability to take a pulse from the arteries. It is a clinical picture that progresses suddenly and unexpectedly with loss of respiration and consciousness. In cardiac arrest situations, basic life support (BLS) applications should be started quickly and effectively. Knowing the appropriate BLS steps and applying them increases the survival chance of the patient in cardiac arrest situations. Success of the BLS implementations require having sufficient knowledge.[11-13] BLS; This is a life-saving application consisting of the quick identification of unresponsive, non-breathing people outside the hospital, activation of the emergency system, chest compressions and artificial respiration cycles, and automatic external defibrillator application, which is included in basic first aid issues. BLS guidelines applied in order to bring the patient back to life in cases of cardiac arrest are updated every five years.[11,12,14] However, during the COVID-19 pandemic period, due to the contagiousness of the virus, the BLS guidelines were updated and some applications were made that emphasized the safety of rescuers/first aiders. In addition to saving the life of the person who had a cardiac arrest, the updates considered the health and safety of the rescuer. Every cardiac arrest case should be considered as a suspected COVID-19 case and the patient should be approached accordingly. Otherwise, infection rates will inevitably increase.[3,15,16]

Basic Life Support Practices in Suspected or Verified COVID-19 Adult Patients

Basic Life Support Practices by Non-Specialist People (First Aiders) (Figure 1)

- If the patient is unresponsive and does not breathe normally, a diagnosis of cardiac arrest should be carried out.
- Consciousness should be assessed by loud shouting to the patient and shaking the patient. During the respiratory assessment, it should be checked whether the patient is breathing normally. At this stage, the airway should not be opened and the rescuer should not bring his/her face close to the patient's mouth or nose to avoid a risk of infection.
- If the patient is unresponsive and breathing abnormally, the emergency health system should be activated.
- During the single-rescuer application, if possible, a phone call with emergency health professionals should be made without using the hands by means of a speakerphone.
- Rescuers should begin BLS practices after activating the emergency health system. While applying cardiac massage/chest compression to the patient, the patient's mouth and nose should be covered with a face mask, cloth or towel-like material. In this way, it is possible to prevent the spread of the virus through the respiratory tract during cardiac massage.
- Non-specialist rescuers should follow all directions from healthcare professionals until they arrive at the scene.
- After BLS applications, the rescuer should wash their hands with soap and water as soon as possible or disinfect their hands with an alcohol-based gel or solution.
- Rescuers should contact a healthcare provider because of suspected or confirmed cases of COVID-19 following BLS applications.[3,8,15,17]

Adult Basic Life Support Practices Performed by Pre-Hospital Health Professionals (Emergency Medical Staff/Emergency Call Center Personnel)

- Pre-hospital health professionals should give instructions to uneducated rescuers about chest compressions.
- If possible, the person(s) in the vicinity should be directed to bring the automatic external defibrillator (AED) to the scene.
- Due to a risk of infection, healthcare professionals are required to wear personal protective equipment. If there is an indication, only defibrillation should be applied to the patient (if the patient is suspected of being COVID-19 positive).

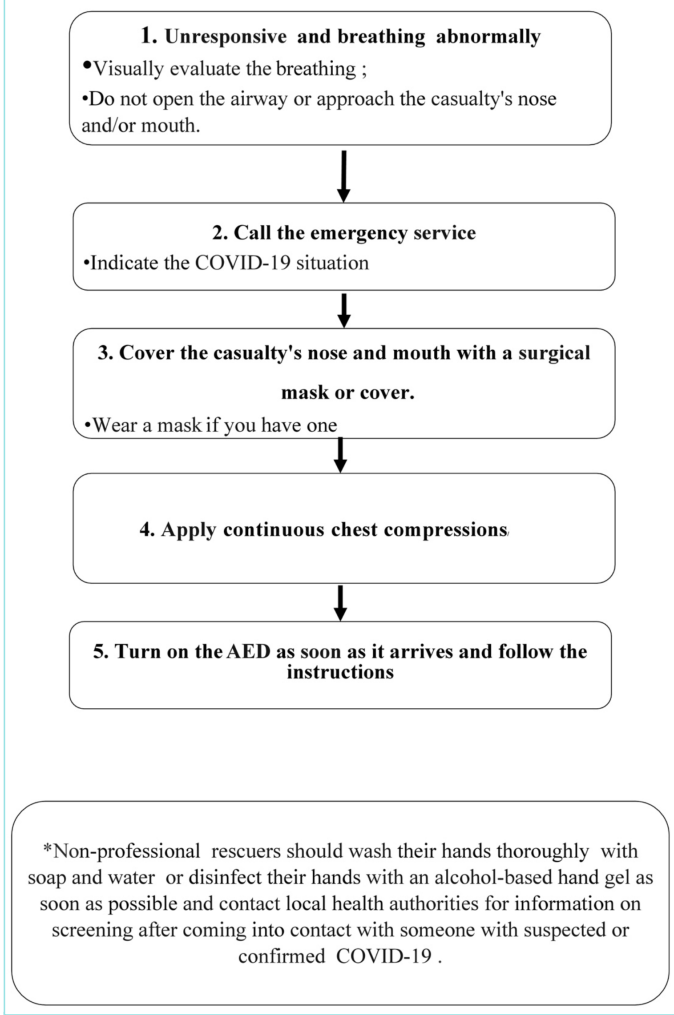

Figure 1. Basic life support practices by non-specialist people (first aiders).

AED: automatic external defibrillator, COVID-19: coronavirus disease 2019

- During the response to diagnosed or suspected COVID-19 cases, rescuers should be guided about access to personal protective equipment and training as healthcare providers, as well as healthcare professionals working in the pre-hospital area and referral units, are entitled to be protected against the risk of COVID-19 transmission.[3,8,15,17]

Adult Basic Life Support Practices Made by Health Care Professionals (Figure 2)

- Health professionals who will provide care in this regard; These should consist of health professionals who have easy access to personal protective equipment suitable for respiratory tract contamination measures and have been trained in this regard.
- Vital signs should be checked and the diagnosis of cardiac arrest should be made.
- The pads of AED and defibrillator devices that will be applied to give electroshock to patients can be used easily. However, with the help of personal protective equipment (liquid-resistant surgical mask, eye protection, gowns and gloves), precautions should be taken against contamination by droplets.
- Healthcare professionals should wear personal protective equipment during basic life support practices (cardiopulmonary resuscitation, maintaining airway clearance and breathing).
- In order to prevent aerosol risk, cardiac massage should be interrupted during ventilation and only heart massage should be applied with 30:2 balloon-valve-mask (BVM) and oxygen. However, if the rescuer team is inexperienced in this regard and is not comfortable with BVM ventilation, the use of BVM is not recommended. They should give oxygen to the patient with an oxygen mask and only perform a heart massage.
- Healthcare professionals should use a bag-mask due to the risk of aerosol formation.
- An oxygen mask should be placed on the patient's face and oxygen should be given like this.
- The mask should be held with both hands to prevent air leakage. However, in cases where there is only one rescuer, after 30 heart massage strokes, air should be provided with a bag.
- In order to minimize the risk of the virus spreading, a high efficiency particulate air filter or heat and moisture exchanger filter should be used between the self-inflating bag and mask.
- A defibrillator or automatic external defibrillator should be applied to the patient in accordance with the instructions.[3,8,15,17]

CONCLUSION

Basic preventive measures against COVID-19, for which there is no specific treatment, are life-saving.

The risk of contamination makes it difficult to perform many routine applications used during clinical practice.

Given COVID-19's prevalence, all cardiac arrest individuals should be treated as possible COVID-19 cases.

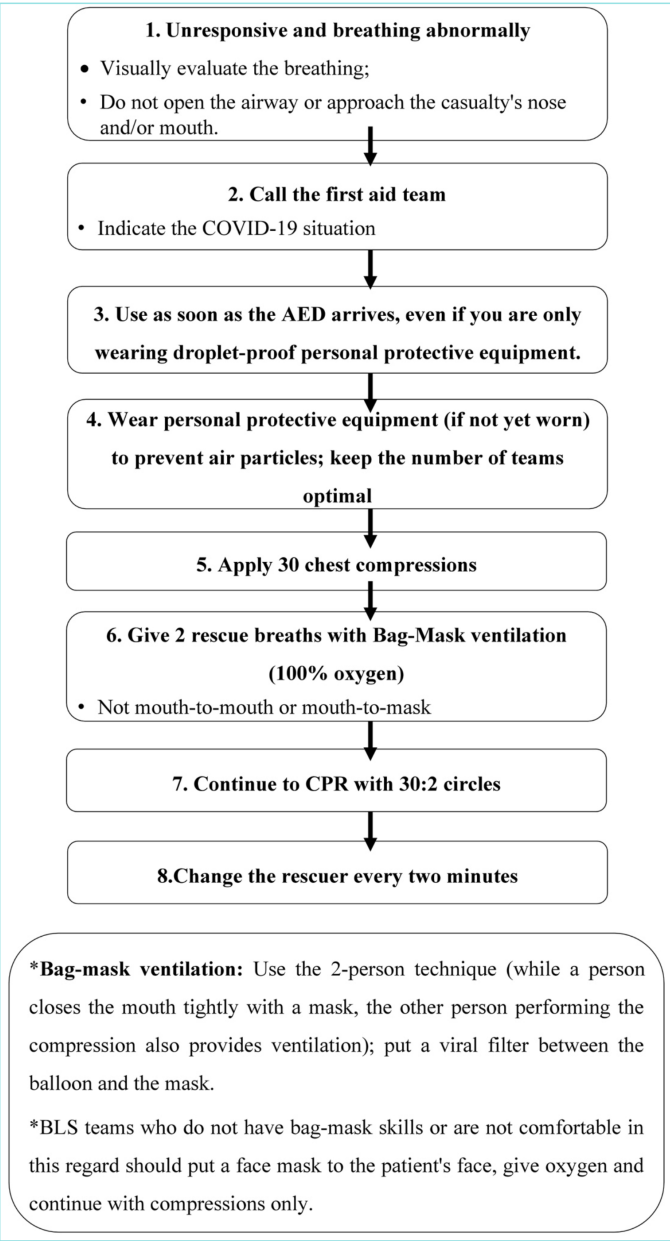

Figure 2. Adult basic life support practices made by health care professionals.

AED: automatic external defibrillator, CPR: cardiopulmonary resuscitation, BLS: basic life support

MAIN POINTS

- While the COVID-19 pandemic is still ongoing, the most at-risk groups affected by the virus are first aiders and healthcare professionals.
- The new directives and guidelines published in order to prevent the transmission of the virus should be followed and implemented.
- Each patient may be a virus carrier or an asymptomatic case. This detail should not be forgotten and the patient should be approached in this way during first aid intervention.

The importance of personal protective equipment has increased even more in this period. It is very important to wear the correct equipment

(gloves, masks, eye protectors, etc.) in cases where mandatory intervention is required.

ETHICS

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Authorship Contributions

Concept: U.K., N.A., Design: U.K., N.A., Supervision: U.K., N.A., Data Collection and/or Processing: U.K., N.A., Literature Search: U.K., N.A., Writing: U.K., N.A., Critical Review: U.K., N.A.

DISCLOSURES

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