Archives of Anesthesiology and Critical Care (Winter 2022); 8(1): 87-88.

Available online at http://aacc.tums.ac.ir

Letter to Editor

Changing the COVID-19 Patients Cardiopulmonary Resuscitation Algorithm Sequence from CAB to ABC

Mostafa Mohammadi[1], Parsa Mohammadi[2], Reza Mollazadeh[3], Ali Esmaeili Vardanjani[4]*

[1]Department of Anesthesiology and Critical Care, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran.

[2]School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

[3]Department of Cardiology, School of Medicine, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran.

[4]Department of Critical Care Nursing, Faculty Member, Hamadan University of Medical Sciences, Hamadan, Iran.

ARTICLE INFO

Article history:
Received 26 August 2021
Revised 16 September 2021
Accepted 30 September 2021

50 years after Peter Safar, the father of cardiopulmonary resuscitation (CPR) , established the CPR sequence as Airway, Breathing and Circulation (ABC) in 1960, in 2010 the American Heart Association changed the CPR sequence from ABC to Circulation, Airway and Breathing (CAB) and gave priority to compression and defibrillation within seconds to minutes after cardiac arrest instead of endotracheal intubation [1].

With the coronavirus pandemic as a contagious disease affecting millions of people, it has become a common occurrence for the healthcare workers when undertaking aerosol generating procedures in COVID-19 patients to get infected with this disease, whereby many medical and nursing staff have died so far [2]. CPR, as one of the most important aerosol generating therapeutic measures [3], exposes the resuscitation team to high levels of getting infected with the COVID-19 virus. Therefore, while considering the adequacy of resuscitation, the need for taking measures to reduce staff infection by safeguarding the patient's airway with the cuffed endotracheal tube was raised [4].

Staff safety

With the aim of increasing the safety and prevention of staff infection during CPR in patients suspected or confirmed with COVID-19, while maintaining resuscitation CAB sequence, CPR algorithm was modified and priority was given to opening the airway and intubate the patient after the first shock [4]. Other suggested measures by modified algorithm to increase the safety of personnel including: donning PPE, limiting the number of present personnel, minimizing aerosolization, avoiding closed-circuit disconnection, intubation done by person with highest likelihood of first attempt success and considering video laryngoscopy [4], But the safest way is intubation with cuffed endotracheal tube [3].

In the modified algorithm, it takes at least about 3 to 4 minutes from starting the CPR until intubation (1- 2 minutes for PPE and 2 minutes for chest compression). In the early minutes, when the patient's airway is not safe in terms of transmission of the virus and aerosols, chest compression, defibrillation and ventilating with positive pressure will release the virus-containing aerosols into the surrounding environment. By continuing the resuscitation of the intubated patient, resuscitation personnel are still exposed to the virus-containing aerosols and are likely to inhale them.

Besides, even by modifying the resuscitation algorithm and acceleration and prioritizing the endotracheal intubation for about four minutes, using the cuffed

The authors declare no conflicts of interest.

*Corresponding author.
E-mail address: aliesmailiv@yahoo.com

endotracheal tube, personnel are still exposed to high infection during CPR.

Mental, physical, and temporal pressures on the staff, their crowd over the patient, damaged PPE, slipping and shifting of the mask on the face due to movements during the chest compression, sweating due to the use of individual protective clothes, and moving of the polluted sweat under the mask, put the resuscitation team personnel at high risk of getting infected with the virus before the intubation [5].

Patients' safety

Due to the structure of hospitals and having multiple patients in multi-bed wards and rooms, this delay in intubation in the process of resuscitation exposes the other patients inside the ward or room, as well as the members of the resuscitation team to virus-containing aerosols.

ABC instead of CAB

Taking all these reasons into account, it is suggested to change the sequence of CPR from CAB to ABC for inpatients suspected or confirmed with COVID-19, and to give the priority to intubating the patient in order to increase the safety of personnel and other patients as well as the adequacy of resuscitation itself.

As well as with the intubation and connecting the patient to the ventilator, one of the members of the resuscitation team is freed and gets the time to help the other members. This change in sequence prevents chest compression interruptions during intubation in the modified algorithm, makes the patient's airway safe in terms of the spread of virus-containing aerosols during CPR.

In addition, since the cardiac arrest in COVID-19 patients occurs more frequently due to ARDS and hypoxia, it seems that a change in the sequence of CPR from CAB to ABC will be effective on the result of chest compression, defibrillation, and resuscitation survival through improving blood and tissue oxygenation.

References

[1] Field JM, Hazinski MF, Sayre MR, Chameides L, Schexnayder SM, Hemphill R, et al. Part 1: executive summary: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation. 2010; 122(18_suppl_3):S640-S56.

[2] Ran L, Chen X, Wang Y, Wu W, Zhang L, Tan X. Risk factors of healthcare workers with corona virus disease 2019: A Retrospective Cohort Study in a Designated Hospital of Wuhan in China. Clin Infect Dis. 2020; 71(16):2218-2221.

[3] Ott M, Milazzo A, Liebau S, Jaki C, Schilling T, Krohn A, et al. Exploration of strategies to reduce aerosol-spread during chest compressions: A simulation and cadaver model. Resuscitation. 2020; 152:192-198.

[4] Edelson DP, Sasson C, Chan PS, Atkins DL, Aziz K, Becker LB, et al. Interim Guidance for Basic and Advanced Life Support in Adults, Children, and Neonates With Suspected or Confirmed COVID-19: From the Emergency Cardiovascular Care Committee and Get With the Guidelines®-Resuscitation Adult and Pediatric Task Forces of the American Heart Association in Collaboration with the American Academy of Pediatrics, American Association for Respiratory Care, American College of Emergency Physicians, The Society of Critical Care Anesthesiologists, and American Society of Anesthesiologists: Supporting Organizations: American Association of Critical Care Nurses and National EMS Physicians. Circulation. 2020; 141(25):e933-e943.

[5] Shao F, Sun P, Tang Z. Cardiopulmonary resuscitation of inpatients with severe COVID-19 pneumonia: the Wuhan experience. Resuscitation. 2020; 152:95-96.