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COMMENTARY

Delayed Intubation During Cardiac Arrest in Covid-19 Patients

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Introduction

Recent guidance from the American Heart Association (AHA) on resuscitation strategies in coronavirus disease of 2019 (Covid-19) includes several notable departures from before, including to proceed directly to endotracheal intubation over non-invasive ventilation (NIV) and to actively pause chest compressions during intubation attempts to minimize the likelihood of unsuccessful attempts [1]. Although such recommendations have a dual focus on protecting frontline rescuers from aerosolizing procedures and addressing the hypoxemia from the Covid-19 the current pandemic presents an opportunity to further embrace contemporary trends from out-of-hospital cardiac arrest (OHCA) that emphasize delayed ventilation and rapid initiation of chest compressions with passive oxygenation. This alternative strategy may have a greater net benefit to patients and rescuers in Covid-19 for reasons we present here.

Delayed Ventilation in Pre-Hospital Cardiac Arrest

Even preceding Covid-19, the optimal approach to initiating ventilation during OHCA had been continually refined in recent years. In the 2010 Guidelines, the traditional cardiopulmonary resuscitation (CPR) sequence of A-B-C (Airway, Breathing, Circulation) was changed to C-A-B for lay rescuers to reflect growing data that rapid initiation of high-quality chest compressions leads to improved survival with neurologic recovery during OHCA [2]. Several bystander studies, including a meta-analysis of 6 trials, had shown that compression-only CPR with minimal interruptions for rescue breaths or positive pressure ventilation (PPV) is non-inferior to CPR with a compression to ventilation ratio of 15:2 in promoting survival with favorable neurological outcomes in OHCA [3].

Among EMS responders, the use of minimally interrupted cardiac resuscitation (MICR) has also been shown to improve neurologically intact hospital discharge in witnessed OHCA with an initial shockable rhythm [4]. In MICR, interruptions in chest compressions are avoided through a coordinated process beginning with a series of 200 chest compressions before defibrillation, PPV, or intubation. Early ventilation is through passive oxygenation using an oropharyngeal airway or face mask which has been associated with improved rates of neurologically intact survival over bag-mask ventilation (BMV). Intubation is delayed until at least 3 cycles of chest compressions or eliminated altogether [5].

Advanced Airway Use During In-Hospital Cardiac Arrest

When the decision to ventilate is made, an advanced airway is frequently placed by skilled providers, a step that is often challenging requiring interruption of chest compressions and leading to increased no-flow time [2]. Compared to OHCA, data on the optimal timing and best approaches for ventilation during in-hospital car-

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diac arrest (IHCA) are limited. In a survey of 438 physicians from 500 centers in mainland China, 180 (41%) reported not beginning ventilation immediately during CPR. Among them, 141 (32%) performed compression-only CPR in the early stages with delayed ventilation and 39% preferred compression-only CPR entirely [6]. No US-based studies of delayed vs. non-ventilation during IHCA have been published to our knowledge.

Airway Management Strategies for Suspected or Confirmed Covid-19

The coronavirus pandemic has led to calls to limit aerosol-generating procedures to prevent transmission of Covid-19 in frontline providers. The AHA recommendations for early intubation and taking steps to reduce failed attempts assumed that advanced airway support is ultimately necessary for Covid-19 patients with acute respiratory failure. We propose to eliminate PPV and delay intubation unless attempts at high-quality compressions and passive oxygenation have failed.

Critics of compression-only CPR often highlight that chest compression alone cannot provide adequate ventilation to maintain oxygenation. Delayed ventilation, especially during the early course of cardiac arrest, may not be detrimental in terms of neurologically intact survival if cardiac output can be maintained with adequate chest compressions. Arterial oxygen levels are typically adequate during this period and can be sufficiently replenished through passive oxygenation provided there is a patent airway [5,7]. In animal models, continuous compressions can maintain relatively higher arterial oxygenation than compressions and ventilations in a ratio of 30:2 for up to 12 minutes [8]. The addition of high-flow oxygen may further aid ventilation by maintaining adequate lung volume during periods of apnea [9]. When early attempts at passive oxygenation have failed, providers should proceed to intubation, however not before delivering a cycle of at least 200 chest compressions.

Conflicts of Interest

None.

References

1. Dana P Edelson, Comilla Sasson, Paul S Chan, Dianne L Atkins, Khalid Aziz, et al. (2020) 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. Circulation 141: e933-e943.

2. Robert A Berg, Robin Hemphill, Benjamin S Abella, Tom P Aufderheide, Diana M Cave, et al. (2010) Part 5: Adult Basic Life Support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation 122: S685-S705.

3. Theresa M Olasveengen, Allan R de Caen, Mary E Mancini, Ian K Maconochie, Richard Aickin, et al. (2017) 2017 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations Summary. Circulation 136: e424-e440.

4. Jarrod Mosier, Ajit Itty, Arthur Sanders, Jane Mohler, Christopher Wendel, et al. (2010) Cardiocerebral Resuscitation is Associated with Improved Survival and Neurologic Outcome from Out-of-Hospital Cardiac Arrest in Elders. Acad Emerg Med 17: 269-275.

5. Bentley J Bobrow, Gordon A Ewy, Lani L Clark, Vatsal-Chikani, Robert A Berg, et al. (2009) Passive Oxygen Insufflation is Superior to Bag-Valve-Mask Ventilation for Witnessed Ventricular Fibrillation Out-of-Hospital Cardiac Arrest. Ann Emerg Med 54: 656-662.

6. Ye-cheng Liu, Yan-meng Qi, Hui Zhang, Joseph Walline, Hua-dong Zhu (2019) A Survey of Ventilation Strategies During Cardiopulmonary Resuscitation. World J Emerg Med 10:222.

7. Jean-Marie Saïssy, Georges Boussignac, EricCheptel, BrunoRouvin, David Fontaine, et al. (2000) Efficacy of Continuous Insufflation of Oxygen Combined with Active Cardiac Compression-Decompression during Out-of-hospital Cardiorespiratory Arrest. Anesthesiology 92: 1523-1530.

8. ShuoWang, ChunshengLi, XianfeiJi, Lin Yang, ZhiyaSu, et al. (2010) Effect of Continuous Compressions and 30:2 Cardiopulmonary Resuscitation on Global Ventilation/Perfusion Values During Resuscitation in a Porcine Model. Crit Care Med 38: 2024-2030.

9. Catherine Bertrand, François Hemery, Pierre Carli, Patrick Goldstein, Catherine Espesson, et al. (2006) Constant Flow Insufflation of Oxygen as the Sole Mode of Ventilation During Out-of-Hospital Cardiac Arrest. Intensive Care Med 32: 843-851.