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-
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


