

Editorial

Cardiopulmonary Resuscitation: Let's Together Step into a New Era!

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1. Introduction

Although the out-of-hospital cardiac arrest (OHCA) survival rate has improved due to the spread of cardiopulmonary resuscitation (CPR) techniques and insights, OHCA remains a major public health issue worldwide [1–3].

In September 2022, our Special Issue titled “Cardiopulmonary Resuscitation: Let's Together Step into a New Era!” was launched in the Journal of Personalized Medicine. Several articles on various topics in CPR will be published, including new studies on treatment. We introduce these papers below and encourage frontier papers on novel findings for the subsequent series. Our journal could provide useful information for improving clinical outcomes after adult OHCA.

2. Influence of Coronavirus Disease 2019

The unprecedented coronavirus disease 2019 (COVID-19) pandemic continues, and the outcomes and clinical characteristics of OHCA due to direct or indirect pandemic effects have received attention. Some meta-analyses reported implications for OHCA epidemiological features and mortality, which differed significantly from those before the pandemic [4,5]. Several studies found that the composition of patients with OHCA changed, with the number of cardiac arrests increasing in COVID-19 patients with respiratory failure. Furthermore, an increase in arrests in private spaces was found to be an indirect effect of social distancing, self-isolation, and the weakening of the survival chain owing to the deviation of medical resources towards COVID-19. However, many factors have changed, including the systematic medical environment, the ability of patients to respond to confirmed or suspected COVID-19, the vaccination rate for COVID-19 [6], the primary COVID-19 subtype [7], and the recent environmental region of COVID-19 spread. Therefore, because these factors were found to have a direct or indirect effect on OHCA in previous studies, a more stratified analysis is required in the constantly changing pandemic environment.

3. Extracorporeal CPR

Several studies [8,9], including small, randomized controlled trials [10], have demonstrated that patients with OHCA who receive extracorporeal CPR (ECPR) have better outcomes than those who receive traditional resuscitation, including increased survival following hospital discharge and improved neurological outcomes.

However, ECPR requires several human and healthcare resources; these are costly and technically challenging, making it difficult to establish programs.

To establish an ECPR program, the following three broad categories should be considered: (1) eligible patient selection, including patient- and cardiac arrest-specific factors;



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(2) the duration of the cardiac arrest, including transport time; and (3) location, including whether the receiving hospital could expeditiously provide ECPR.

Previous protocols and guidelines strived to identify patients most likely to survive with favorable neurological outcomes; these included an age of <70 years, witnessed arrest, an arrest to first CPR (no-flow interval) of <5 min, an initial cardiac rhythm of ventricular tachycardia and fibrillation, and cardiogenic arrest [11,12]. However, no robust data are available to identify those who may benefit from ECPR. Although it has been reported that most survivors underwent extracorporeal membrane oxygenation support within <60 min of the onset of cardiac arrest, among non-hypothermic arrests, the optimal duration before the initiation of ECPR in cases of refractory cardiac arrest is yet to be determined [13]. Many hospitals have specific time-based criteria, including the no-flow time (the time from the onset of cardiac arrest to starting CPR) and low-flow time (the time from CPR to ECPR cannulation), highlighting the need to transport ECPR candidates to appropriate centers [14,15].

Therefore, understanding the current and future state of ECPR is a critical step toward effective worldwide implementation. Additionally, further research into economic analyses, including cost-effectiveness and cost-utility, is required before the global adoption of ECPR programs.

In this upcoming Special Issue of the Journal of Personalized Medicine, we aim to discuss the etiology, pathophysiology, clinical manifestations, diagnostics, and optimal management involved in treating patients with OHCA. Since we aim to attract a global audience, we welcome contributions on the subject from anywhere in the world.

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