

Introduction

Out-of-hospital cardiac arrest (OHCA) is a major global health concern with regionally variable outcomes. Extracorporeal cardiopulmonary resuscitation (ECPR), using extracorporeal membrane oxygenation (ECMO), has been proposed for patients unresponsive to conventional CPR (CCPR), though its effectiveness remains uncertain, especially in Asian populations. While several studies have examined ECPR, few have evaluated its impact within region-specific ECMO selection criteria.[1,2,3] To address this gap, we conducted a retrospective cohort study focusing on ECPR survival and neurological outcomes in OHCA patients treated within our local clinical framework.

Methodology

We retrospectively analyzed 470 adult OHCA patients treated with CPR in the ED of our hospital between 2011 and 2025. Patients were excluded if they had contraindications for ECMO, including do-not-resuscitate (DNR) orders, trauma, acute intracranial hemorrhage or infarction, uncontrolled bleeding, terminal malignancy, ventilator dependence over one month, multiorgan failure, or signs of irreversible death such as rigor mortis or livor mortis. All ECMO procedures were performed by certified cardiac surgeons.

Results

Of the 470 patients, 71 received ECPR and 399 received CCPR. The overall survival to hospital discharge was 14.08% (10/71) in the ECPR group and 16.54% (66/399) in the CCPR group. No significant difference in survival was observed between groups ($p = 0.604$). Multivariate logistic regression adjusting for confounders showed no statistically significant difference (adjusted odds ratio = 0.88; 95% CI: 0.41–1.87; $p = 0.42$). Favorable neurological outcomes (CPC 1–2) were similar between groups (40.0% vs. 45.5%, $p = 0.66$). The number of patients receiving ECPR or CCPR was further stratified by 10-year age intervals, but no significant differences in survival to discharge were observed within any age stratum.

Discussion

In this single-center retrospective study, ECPR did not show a significant survival or neurological advantage over CCPR in OHCA patients. Although predefined ECMO exclusion criteria were applied, a standardized protocol for ECPR indication was absent. This variability may have influenced outcomes and underscores the need for more consistent patient selection. Our findings do not support indiscriminate ECPR use, meaning applying ECMO without clear clinical criteria.

Conclusion

ECPR should be used selectively within well-defined clinical frameworks, and further studies are needed to clarify its optimal use.

Keywords: Extracorporeal Membrane Oxygenation; Out-of-hospital cardiac arrest; Asian

References:

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