A Retrospective Analysis of the Outcomes of Extracorporeal Cardiopulmonary Resuscitation (ECPR).

Rachel Wills

Kennedy Gallagher

James A. Burke MD
Lehigh Valley Health Network, James_A.Burke@lvhn.org

Tim S. Misselbeck MD
Lehigh Valley Health Network, Timothy_S.Misselbeck@lvhn.org

James K. Wu MD
Lehigh Valley Health Network, james.wu@lvhn.org

Published In/Presented At

Wills, R. Gallagher, K. Burke, J. Misselbeck, T. S., Wu, J. (2017, September 25). *A Retrospective Analysis of the Outcomes of Extracorporeal Cardiopulmonary Resuscitation (ECPR)*. Poster Presented at: The Extracorporeal Life Support Organization (ELSO) Conference, Baltimore, MD.

A Retrospective Analysis of the Outcomes of Extracorporeal Cardiopulmonary Resuscitation (ECPR)

Rachel Wills[1]; Kennedy Gallagher[1]; James Burke, MD[2]; Timothy S. Misselbeck, MD[1]; James Wu, MD[1]

[1]Division of Cardiothoracic Surgery, [2]Division of Cardiology

Lehigh Valley Health Network, Allentown, Pennsylvania

BACKGROUND

- Extracorporeal cardiopulmonary resuscitation (ECPR) is a form of veno-arterial extracorporeal membrane oxygenation (VA-ECMO) wherein the support is administered during cardiac arrest to externally sustain circulation[1]
- Once it is determined that a patient undergoing cardiac arrest has the potential for recovery and eventual weaning, ECPR is utilized in attempt to increase survival to discharge, which is otherwise low with traditional cardiopulmonary resuscitation (CPR)[2]
- ECPR is a temporary treatment to allow for a duration of cardiopulmonary rest due to anticipated system healing with time, yet is not a curative measure

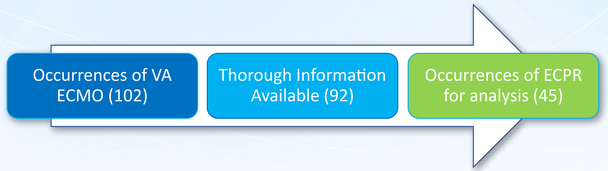
OBJECTIVE

- As a single-center, retrospective chart analysis, this study aims to determine the overall outcomes of patients who underwent ECPR at Lehigh Valley Health Network from 2013-2017

METHODS

1. Categorization of patients undergoing VA ECMO and exclusion of those not for the purpose of ECPR
2. Analysis of 45 ECPR patient outcomes and correlational study with date-based cohorts
3. Consultation and comparison with previous studies to find support or refutation for findings

OUTCOMES



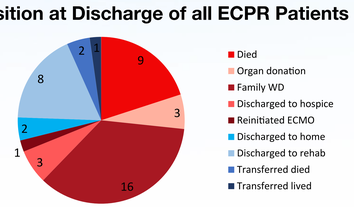


Figure 1: Good outcomes, shown in blue, were defined as survival at the time of discharge with no consideration for post-discharge outcomes, and thus all not included within this definition were defined as bad outcomes, shown in red. The distribution of overall outcomes of ECPR patients demonstrates 29% survival to discharge.

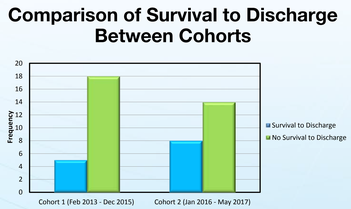


Figure 2: All patients who underwent ECPR were split into either one of two cohorts based upon the date of ECPR initiation, with 23 patients in the first and 22 in the second. The distribution of Cohort 1 indicated 22% survival to discharge, whereas Cohort 2 reported 36% survival to discharge.

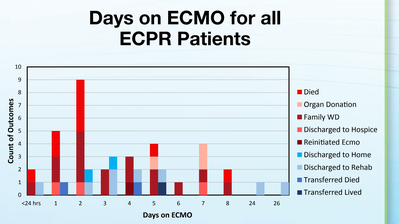


Figure 3: Disposition at discharge of patients were reported based upon the number of days ECPR support was needed prior to weaning, regardless of weaning success. All patients were weaned from ECPR or care was withdrawn within 8 days of their administration with the exception of two cases.

RESULTS

- With 29% (95%CI 16-42%) overall survival outcomes, LVHN is consistent with published survival rates[2,3]
- There was a 14% increase in survival to discharge between the cohorts (Cohort 1: 2013-2015, Cohort 2: 2016-2017)
- All ECPR patients had been weaned by or on day 8 with the exception of two patients on day 24 and 26, which were converted to veno-venous (VV) ECMO on day 8 and 2, respectively
- No correlation could be seen between days on ECPR and survival to discharge

CONCLUSIONS

- Survival of cardiac arrest patients without ROSC is poor without adjunctive treatment
- Survival rates improved with increased experience of the team and institution over time

References:

1. Abrams, D., & Brodie, D. (2015). Novel uses of extracorporeal membrane oxygenation in adults. *Clinics in Chest Medicine*, 36(3), 373-384. doi: 10.1016/j.ccm.2015.05.014
2. Chen, Y.S., Chao, A., Yu, H.Y., Ko, W.J., Wu, I.H., Chen, J.C., Huang, S.H..,… Wang, S.S. (2003). Analysis and results of prolonged resuscitation in cardiac arrest patients rescued by extracorporeal membrane oxygenation. Journal of the American College of Cardiology, 41(2), 197-203. https://doi.org/10.1016/S0735-1097(02)02716-X
3. Richardson, A., Schmidt, M., Bailey, M., Pellegrino, V., Rycus, P., & Pilcher, D. (2017). ECMO cardio-Pulmonary resuscitation (ECPR), trends in survival from an international multicentre cohort study over 12-years. Resuscitation, 112, 34-40. doi:10.1016/j.resuscitation.2016.12.009