

Introduction

Extracorporeal membrane oxygenation (ECMO) is a rare and relatively new method of life support for patients with severe cardiac and/or respiratory failure in West Virginia. While it is a life-saving procedure, research to date from other centers has shown that significant physical deconditioning can result, as well as cognitive impacts. These effects may be even more dramatic than is known to occur in other critically ill populations. One small study conducted in 2012 of ECMO survivors in Australia found that many survivors had many issues 8 months following return to home, but it is not known how long lasting these effects may be and whether these patients are able to return to normal function after surviving to return home. Therefore, we sought to assess the basic mobility, daily activity and cognitive function of patients following return to home to determine potential need for rehabilitation services in patients' home communities.

Methods

Design & Materials:

A convenience sample of ECMO survivors were surveyed during routine clinic follow-up appointments, using the Activity Measure for Post-Acute Care (AM-PAC) outpatient surveys for Basic Mobility, Daily Activities, and Cognitive Function. Retrospective medical record review was performed to assess age, sex, length and type of ECMO, diagnosis requiring ECMO and length of time since hospital discharge. Survey responses were converted to percent impairment per AM-PAC scoring protocol.

Participants:

A total of 9 participants completed the AM-PAC surveys (5 women, 4 men, ranging in age from 21-60 years). Of the 9, veno-venous ECMO was required for support of the pulmonary system for 7, and veno-arterial ECMO was required to support cardiopulmonary function for the remaining 2.

Inclusion Criteria:

Inclusion criteria consisted of male and female ECMO survivors attending an outpatient ECMO follow up appointment at the Heart and Vascular Institute of WVUMedicine.

Exclusion Criteria:

Those who had been on ECMO support for less than 24 hours during hospital admission were excluded from this study

Results

- Time since hospital discharge to survey completion was, on average 8.8 months, ranging from 2 weeks to 18.6 months.
- Only 1 participant reported no residual deficits on any of the three AM-PAC surveys. This was also the youngest participant, who was in his early 20s when cannulated.

Mobility/Daily Activities

- 89% of participants report ongoing mobility deficits (range 11-100% impaired).
- 89% also report difficulty completing ADL tasks independently (range 4-81% impaired).
- These individuals report now requiring increased time, assistive devices or an assistive person to complete mobility and/or ADL tasks even 18.6 months following hospital discharge.
- These individuals also report these deficits cause them to be unable to participate in regular physical activity to promote a healthier lifestyle.

Cognition

- 56% report lasting cognitive changes, whether it be regarding memory, communication, or higher level activities such as time or money management (range 25-48% impaired).
- Those surveyed report these cognitive changes lasting up to 17.8 months.
- Anecdotally, all participants reported feeling temporary mental health challenges during recovery, such as being embarrassed to leave the home because of slow gait speed, low motivation to work toward regaining independence, feeling hopeless about obtaining full independence again, etc.



Discussion

ECMO, while lifesaving, can cause long-lasting functional deficits which limit the survivor's ability perform the physical and cognitive daily tasks required for fully reintegrating into home, work and community life. Based on our preliminary data, these deficits are common, can be severe and are often long lasting. Many of the deficits may be improved or resolved through appropriate rehabilitation services, but it is unclear if these services are fully utilized. Data collection is actively ongoing to continue to document long-term impairments and to provide support for an ECMO survivors interprofessional clinic to facilitate rehabilitation services in patients' home communities. Based on findings thus far, there is much need in this unique population.

Conclusion

Rehabilitation professionals in communities throughout West Virginia should be aware of this new and growing population of ECMO survivors and their frequent/severe physical and cognitive needs. Communication and coordination of services with ECMO specialized team members are likely needed to provide optimal services and help return survivors to full participation in their communities.

References & Acknowledgments

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2. Jette A, Haley S, Coster W, Pengshang N. AM-PAC Short Form Manual 3.0. Boston, Massachusetts. 2019.
3. WVU Medicine. <https://medicine.hsc.wvu.edu/News/Story?headline=wvu-heart-and-vascular-institute-gains-national-recognition-for-life-saving-ecmo-treatment>. Published July 2018. Accessed May 2020.
4. We greatly appreciate the entire ECMO team of the Heart and Vascular Institute and the Rehabilitation Services team for working together and supporting early mobilization of patients requiring ECMO support. We would also like to thank the patients and their caregivers for participating in the survey process.