

Barbaro R.P., et al. Extracorporeal membrane oxygenation support in COVID-19: an international cohort study of the Extracorporeal Life Support Organization registry. *The Lancet* Oct 2020

STUDY HIGHLIGHTS

Study goal:

Characterize the epidemiology, hospital course, and outcomes of patients with COVID-19 on ECMO

Study population:

1035 patients from Extracorporeal Life Support Organization (ELSO) Registry

Results:

In-hospital mortality after 90 days ECMO was 37.4% (95% CI 34.4–40.4). In the ARDS (VV ECMO and ARDS) group, in-hospital mortality after ECMO was 38%. ECMO for **circulatory support** was associated with **↑** in-hospital mortality (HR 1.89), as was **↑** **age, immunocompromised status**

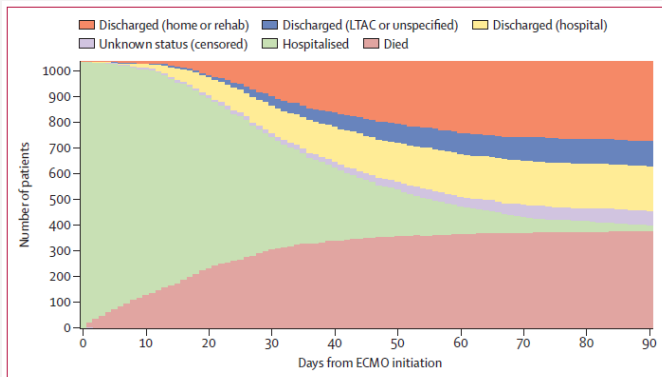


Figure 1: Stacked bar plots of disposition over time for patients with COVID-19 who received ECMO

CENTRAL FIGURE

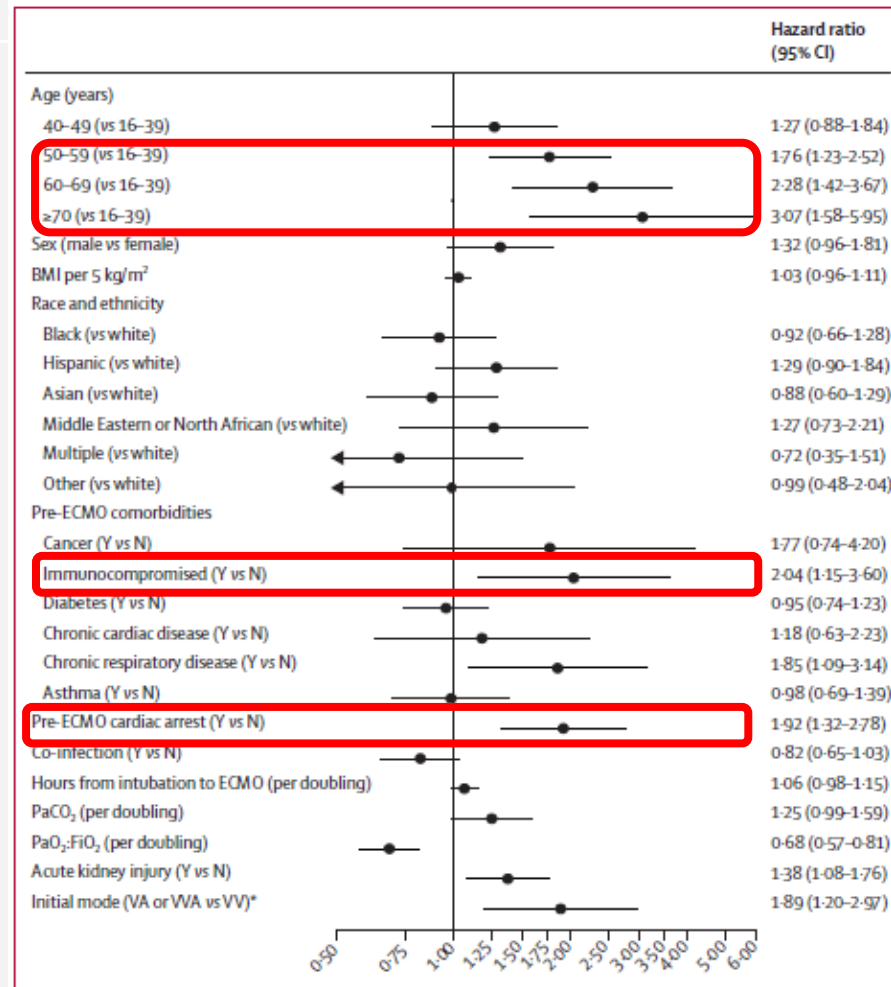


Figure 2: Cox model for factors associated with in-hospital mortality in patients with COVID-19 supported

REVIEWER'S COMMENTS

Strengths:

- **Large patient numbers** and good statistical analysis, minimizing bias.
- Counter weight for earlier studies that reported a high mortality 90% of ECMO in COVID-19.
- Results comparable to other studies in ARDS (non-COVID-19).

Limitations:

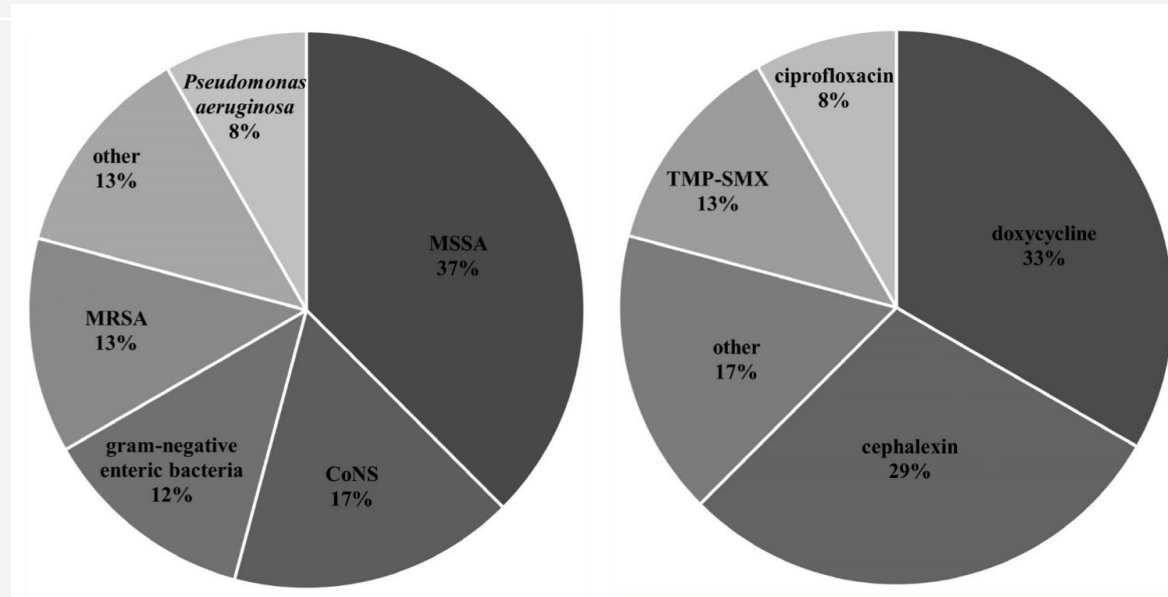
- No data for long-term outcome.
- Results are biased by the fact that only centers contributing to ELSO registry are included.
- Since this is not an RCT, **no conclusion about mortality of ECMO versus conventional treatment** can be made.

Radcliffe et al. Efficacy and Safety of Chronic Antimicrobial Suppression (CAS) Therapy for Left Ventricular Assist Device Driveline Infections (DLI): A Single-Center Descriptive Experience. *Transplant Infectious Diseases*.

STUDY HIGHLIGHTS

- Retrospective review of 219 patients with LVADs at Yale New Haven Hospital from 2007-2019
 - 18% incidence DLI
- CAS defined as receiving antimicrobial therapy for >2 weeks after completion of treatment course for DLI
- 24 received CAS for DLI
 - Mean 56 years old
 - 50% female, 63% CKD
 - 50% *Staphylococcus aureus*
 - Mean length 486 days (range 48-2287)
- 50% successful outcomes
- 29% treatment failures
 - Relapses
 - New infection on CAS

CENTRAL FIGURE



Microbiology of initial DLI for patients on CAS

Antimicrobial agents used in initial CAS regimens

- 6 relapses on CAS
 - 1 CoNS, 2 MRSA, 2 MSSA
 - 1 *Serratia marcescens*
- 3 new infections on CAS
 - Cipro/doxy → ESBL *E. coli*
 - Doxy → *Proteus mirabilis*
 - Cefuroxime → *S. marcescens*

REVIEWER'S COMMENTS

- Patients on CAS who developed relapses were infected with Staphylococcal species
- CAS led to selection of bacteria resistant to CAS regimen

Limitations:

- Retrospective study design
 - No control group
 - No institutional protocol for initiation of CAS
- Single center study
- Small sample size

Garrigos, Z.E. et al. Management and Outcome of Left Ventricular Assist Device Infections in Patients Undergoing Cardiac Transplantation. *Open Forum Infectious Diseases*

STUDY HIGHLIGHTS

Question: How long do patients with LVAD infections need to be treated post-transplant?

Design: Retrospective, Single Center.

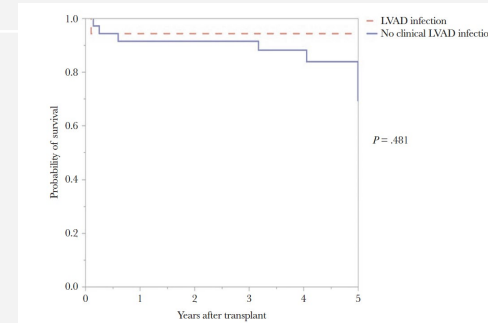
Inclusion: n = 54 cases receiving antimicrobial therapy at time of transplant either for initial treatment or chronic suppression; 18 = LVAD-specific or related infections; 36 = non-LVAD infections

Results:

- LVAD-related infection group had ↑ rates of **diabetes, hypertension, and median Charlson comorbidity index score** at time of transplantation.
- Antimicrobial therapy was extended posttransplant to treat preceding proven LVAD-specific infection (9 of 13, 69.2%) with a **median duration of 14 days** (IQR 14–28).
- After LVAD removal, antimicrobial treatment was not continued for preceding LVAD-related infections
- **None** of the patients in the LVAD- infection group experienced **infection relapse** after discharge

CENTRAL FIGURES

Category	Definition
LVAD specific-infection ^a	Pump and/or cannula infections Pocket infections Percutaneous driveline infection Deep infection Superficial infection ^a >2 LVAD components
LVAD related-infection	Infective endocarditis BSI CVC Present BSI presumed LVAD-related BSI presumed CVC-related No CVC Present BS LVAD-related BSI non-LVAD-related Mediastinitis
	LVAD-Related Sternal wound infection SSI-organ space Pocket infection Non-LVAD related Other causes of mediastinitis



Survival analysis between LVAD-infected and noninfected LVAD cases. **No significant difference in the overall 5-year posttransplant.**

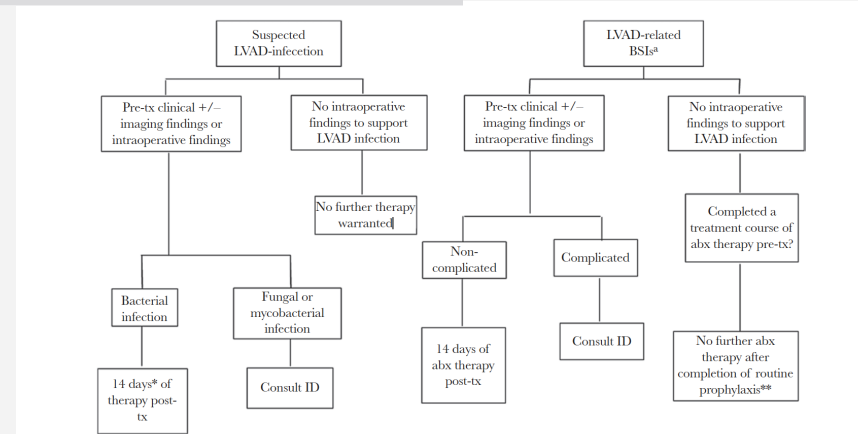


Figure 3. Management of suspected left ventricular assist device (LVAD) infection at the time of heart transplant. *, Longer if complications such as mediastinitis or need for further debridement. **, Duration of routine perioperative prophylaxis at our institution is 48 hours posttransplant. ^aIf bloodstream infection (BSI) with fungal or mycobacterial organisms, consult Infectious Diseases (ID). abx, antibiotic; tx, transplant.

Study Center's Treatment Algorithm

REVIEWER'S COMMENTS

- **Shorter antimicrobial treatment courses (14 days) may be considered in LVAD infections once source is removed**
- More large center and multicenter studies need to be done

Limitations:

- Retrospective
- Decision to treat or not was based on micro data and gross inspection at the time of procedure, which can be subjective
- Prolonged antimicrobial therapy before transplant could have affected intraoperative cultures.
- Histological exam was rarely obtained, which does not align with the recommendation by ISHLT to confirm infection diagnosis
- Use of antibiotics to treat or prevent other infections could have also decreased yield or selected out resistant organisms.