Lactate Trends in Veno-Arterial Extracorporeal Membrane Oxygenation Patients Presenting with Sepsis

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BACKGROUND

- Sepsis is a potentially life-threatening medical condition that results from the complication of an inflammatory response due to infection.[1]
- Lactate levels in sepsis patients are elevated as a result of organ failure and anaerobic metabolism.[2]
- Veno-Arterial Extracorporeal Membrane Oxygenation (VA-ECMO) is a specialized form of heart-lung bypass that can be used to treat septic patients with myocardial injury.[3]

OBJECTIVE

- This study aims to analyze the relationship between lactate levels of VA-ECMO-treated sepsis patients and survival at discharge.

METHODS

Retrospective chart review of all VA-ECMO patients with Sepsis from 2013-2018 at the Lehigh Valley Health Network

Data collection of patient demographic information, related variables, and outcomes

Analysis and correlational studies between lactate levels and patient survival

OUTCOMES

Figure 1: Demographic information of VA-ECMO treated sepsis patients, including subdivisions between the living and deceased cohorts

Demographic Characteristics of VA-ECMO-Treated MI Patients	
Characteristic	**No. (% of n or mean ± SD)**
Men	90%
Women	10%
Age	56.0 ± 15.1
Survival	30%
Characteristics of Living Patients	
Men	100%
Women	0%
Age	58.5 ± 13.6
Characteristics of Deceased Patients	
Men	86%
Women	14%
Age	54.9 ± 16.1

Figure 2: Difference in average lactate levels upon hospital admission between the sepsis patients that lived and the sepsis patients that died after ECMO treatment

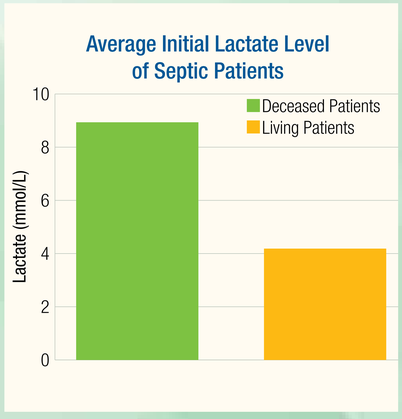
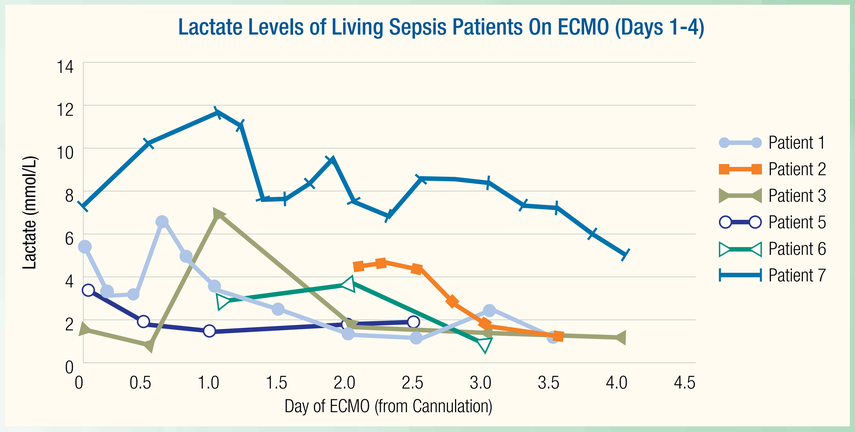


Figure 3: Display of the lactate levels of the seven patients that lived returning to normal physiological levels during the first four days of ECMO treatment



RESULTS

- Of the 20 sepsis patients who underwent ECMO treatment, 30% of the patients survived.
  - The average lactate level of patients who survived was 4.18 mmol/L.
  - The average lactate level of patients who did not survive was 8.94 mmol/L.
- In patients who survived, lactate levels trended down and stabilized within the first four days of ECMO treatment while lactate levels of the patients who did not survive did not return to within the normal range [0.5-2.1].

CONCLUSION

- Recorded lactate levels before and within the first 4 days of ECMO treatment help to determine trends in patient survival.
- On average, lactate levels well above the normal range resulted in a higher mortality rate.
- Future studies should look to determine if there is a lactate level threshold over which survival is rare.

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