Does Pre-Procedural pH Affect Outcomes in Veno-Arterial Extracorporeal Membrane Oxygenation Patients with Myocardial Infarction?

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BACKGROUND
• Myocardial infarction (MI), commonly called a heart attack occurs when blockage of blood to the heart muscle leads to decreased cardiac output and delivery of oxygen to the body.¹
• Metabolic acidosis is found to occur in patients with an MI.¹
• Veno-arterial extracorporeal membrane oxygenation (VA-ECMO) is an effective form of mechanical circulatory support for patients with cardiac failure.²
• In cases of cardiac arrest, extracorporeal cardiopulmonary resuscitation (ECPR) is administered.³

OBJECTIVE
• To identify the relationship between initial pH levels and survival in patients who presented with MI and required VA-ECMO treatment

METHODS
• Retrospective chart review of all VA-ECMO patients with MI from 2013–2018 at the Lehigh Valley Health Network
• Data collection and analysis of 34 patients: 15 patients who received ECPR and 19 patients with non-ECPR related incidences
• Comparison of results to previous research studies conducted in the field

OUTCOMES

RESULTS
• Of the 34 VA-ECMO-treated MI patients, 35% had an outcome of survival to discharge
  • Of the 15 ECPR patients, only 6.7% of patients survived
  • Of the 19 non-ECPR patients, 58% of patients survived
• Survival outcomes with ECPR is very poor (6.7%), in accordance with significantly lower pH levels (pH = 7.00)
• Patients with a pH lower than 7.02 within 24 hours prior to ECMO cannulation did not survive

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.

REFERENCES