Current applications and outcomes of venoarterial extracorporeal membrane oxygenation based on six years of experience. Risk factors for in-hospital mortality

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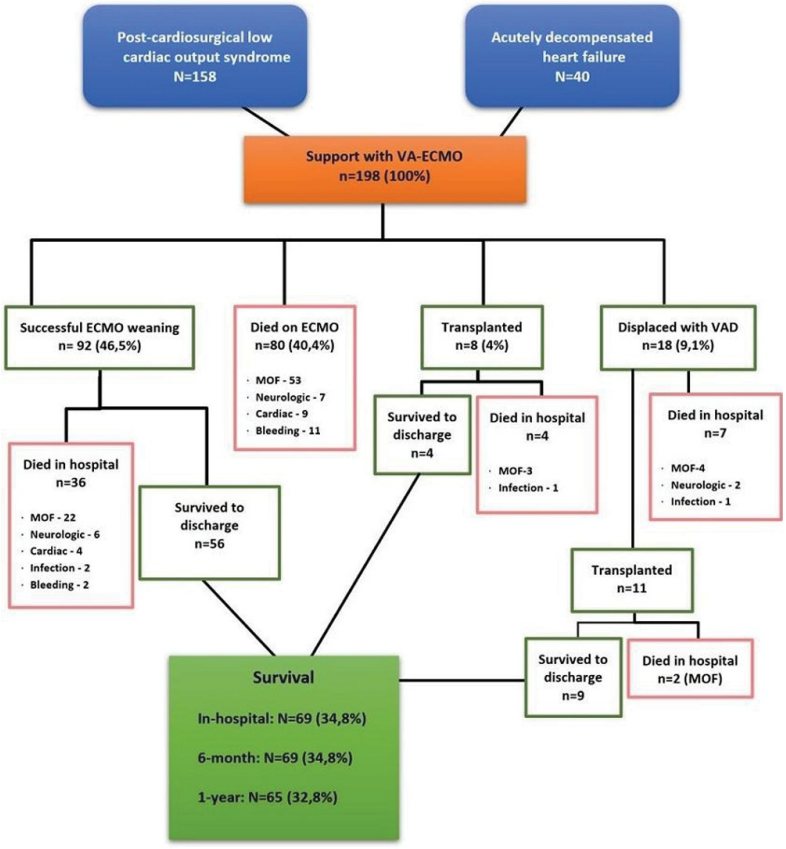
Introduction: The data about use of venoarterial ECMO as a temporary circulatory support system in cardiogenic shock (CS) for Central Europe are scarce.
Objectives: The aim was to disclose the indications, in-hospital and long-term (1 year) mortality along with risk factors.
Patients and methods: The study is a retrospective investigation of patients who underwent VA ECMO support for the CS in the cardiac and cardiosurgical tertiary centre, from January 2013 to June 2018. We tested a broad spectrum of pre– and post-implantation factors along with their impact on mortality using univariate logistic regression analysis.
Results: 198 patients met the inclusion criteria. The median duration of support was 207 (IQR 91–339) hours, with no significant disparity in the length of support among hospital survivors and nonsurvivors (p=0.09). 40,4% of all patients deceased during ECMO support, while the joined in-hospital and six-month mortality progressed to 65,2% and one-year mortality to 67,2%. 9% underwent subsequent heart transplantation. The most frequent adverse events were bleeding (76%), infection (56%), neurologic injury (15%) and limb ischemia (15%). Multi-organ failure was identified as the most decisive risk factor of in-hospital mortality (OR 4,45, p<0,001). Patients with postcardiotomy cardiogenic shock had a significantly lower out-of-hospital survival rate than those with decompensated heart failure (32,3% vs 45%, log-rank p=0,037). The learning curve of our centre is noted with the lowest survival in the first two years of ECMO employment in comparison to the following 6-year period.
Conclusion: The outcomes of the study reinforce the clear survival benefit, despite frequent complications.
The protocol focusing on proper candidate selection and timing can positively impact patients survival. The additional risk reduction can be achieved with the further increase of the team experience with ECMO.

Study flowchart of 198 patients treated with venoarterial ECMO.



MOF-Multiorgan failure; **VAD**-Ventricular Assist Device, **Cardiac-** death due to the insufficient cardiac regeneration, sudden cardiac death; **Neurologic-** death due to fatal intracranial haemorrhage, stroke, anoxia, brain death; **Infection**-death due to the uncontrollable infection, bacterial or fungal; **Bleeding**-death due to definitive fatal bleeding, overt bleeding or confirmed on autopsy (BARC 5b);

Figure 1

The learning curve of 8 years of experience.

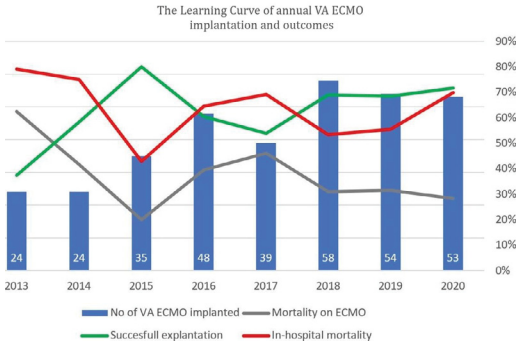


Figure 2