

# Ten years of extracorporeal membrane oxygenation support at University Hospital Centre Zagreb

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**KEYWORDS:** extracorporeal membrane oxygenation, survival, SAVE score, cardiopulmonary support.

**CITATION:** *Cardiol Croat.* 2021;16(1-2):21-2. | <https://doi.org/10.15836/ccar2021.21>

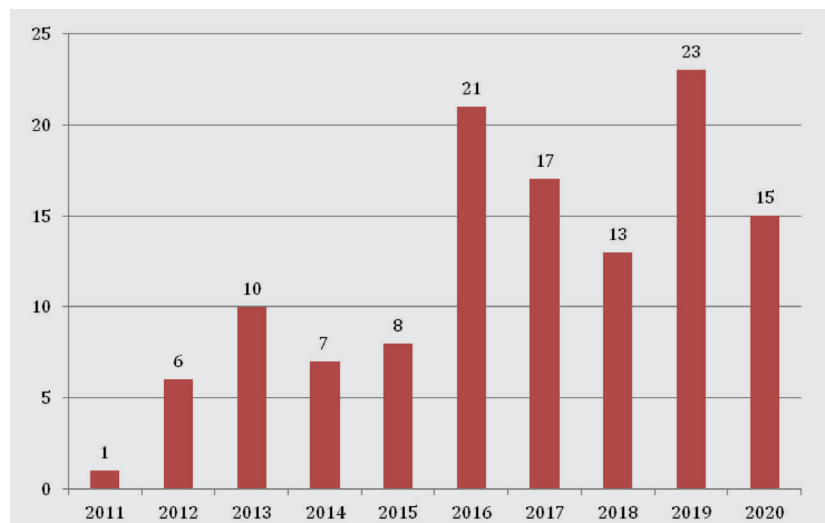
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**Background:** Venoarterial extracorporeal membrane oxygenation (VA-ECMO) is increasingly used in patients during cardiac arrest and cardiogenic shock and is associated with increased survival rate<sup>1</sup>. Since mortality on ECMO is still rather high, SAVE (Survival after Veno-Arterial ECMO) score can be used to predict survival from refractory cardiogenic shock requiring ECMO<sup>2</sup>.

**Patients and Methods:** We performed a retrospective analysis of 121 patients (78% male) who underwent VA-ECMO implantation in our Department from January 2011 till November 2020 (**Figure 1** and **Table 1**).

**Results:** Median age was 58 years with 21% of patients older than 65 years. Median of ECMO duration was 6 days. The most common causes of cardiogenic shock were acute myocardial infarction and cardiomyopathy (53% and 37%, respectively) (**Figure 2**), and 37% patients were implanted during cardiopulmonary resuscitation (eCPR). Overall survival on ECMO support was 59%, but in patients after CPR only 34%. Furthermore, of all patients, 34% were successfully weaned and the rest who survived continued on advanced heart failure therapies (**Figure 3**), but overall survival in follow-up was only 26%. Median SAVE score was -8 with significantly less negative values in patients younger than 65 and treated after 2015. Also, patients treated before 2015 had significantly higher values of creatinine, free hemoglobin and international normalized ratio (INR) and their survival rate was only 39%, in comparison to those who were implanted after 2015 whose survival rate was 62%.



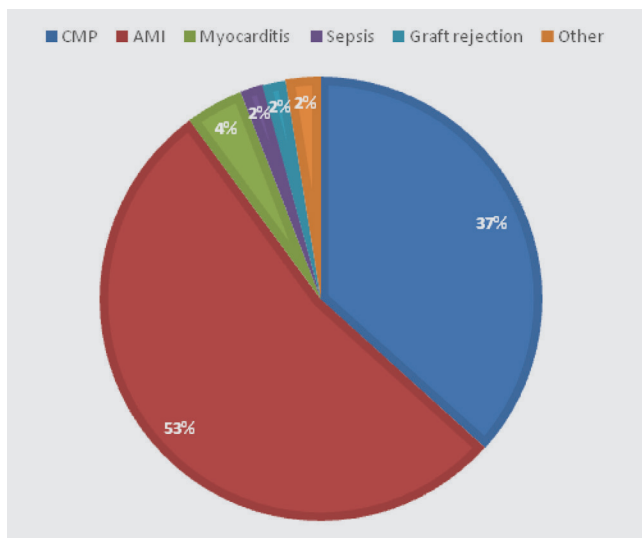
**FIGURE 1.** Number of venoarterial extracorporeal membrane oxygenation implantations from January 2011 to November 2020.

**RECEIVED:**  
December 14, 2020  
**ACCEPTED:**  
December 18, 2020



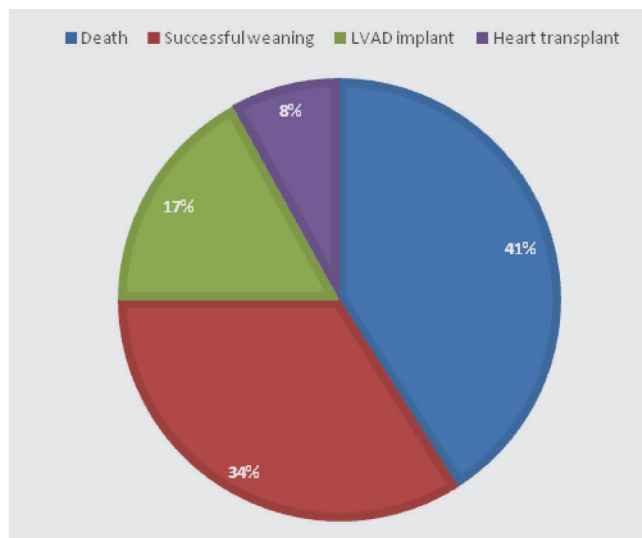
**TABLE 1. Clinical characteristics and laboratory values prior to venoarterial extracorporeal membrane oxygenation implantation.**

Age, years (Mdn, IQR)	58 (49-64)
Gender male (N, %)	94 (78)
BMI, kg/m <sup>2</sup> (Mdn, IQR)	27 (24-30)
Creatinine, qmol/L (Mdn, IQR)	130 (87-173)
Bilirubin, qmol/L (Mdn, IQR)	16 (10-34)
INR (Mdn, IQR)	1.2 (1.05-1.52)
NT-proBNP, ng/L (Mdn, IQR)	7654 (2834-15582)
TnT, ng/L (Mdn, IQR)	292 (43-2620)
LDH, U/L (Mdn, IQR)	755 (293-1817)
CRP, mg/L (Mdn, IQR)	20 (4-74)
SAVE score (Mdn, IQR)	-8 (-12 - -4)
ECMO, days (Mdn, IQR)	6 (3-10)
ECMO during CPR (N, %)	44 (37)



**FIGURE 2. Etiology of cardiogenic shock.**

CMP = cardiomyopathy; AMI = acute myocardial infarction



**FIGURE 3. Outcomes of patients on venoarterial extracorporeal membrane oxygenation implantation.**

LVAD = left ventricular assist device

**Conclusion:** Although results with ECMO support in cardiogenic shock in our Department improved throughout 10-years experience, they still exhibit high long-term mortality. Our observations reinforce the need for thorough assessment of each ECMO candidate, especially in respect to patient's age, end-organ failure and SAVE score as key steps to ensure optimal outcomes.

**LITERATURE**

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