

COVID-19 era: time for temporary mechanical circulatory support?

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INTRODUCTION

The Coronavirus disease 19 (COVID-19) pandemic has impacted clinical practice with important changes in the most affected areas, resulting in increased mortality from heart disease (myocardial infarction). The feasibility of continuing a temporary mechanical circulatory support (MCS) program is unknown.

PURPOSE

Our objective was to analyze the survival of patients requiring short-term MCS with veno-arterial extracorporeal membrane oxygenation (VA-ECMO) or Impella CP® during the COVID-19 pandemic.

METHODS

Retrospective study including all VA-ECMO and Impella CP® implants in a referral hospital since March 2020 compared to previous implants results.

RESULTS

Out of 167 short-term MCS implanted from 2013, 25 (15%) were conducted during the time of COVID-19 pandemic: 19 VA-ECMO and 6 Impella CP® (Table).

Compared to preCOVID-19 implants, patients requiring MCS in the COVID era presented more frequently right ventricular dysfunction (p = 0.005) and showed a trend towards older age (p = 0.069) and lower left ventricular ejection fraction (p = 0.063), without other significant differences regarding the baseline situation and implant technique (Table). Encephalopathy was more frequent in the COVID-19 era, with no differences in other complications (Table).

Survival at discharge was 43.7% in the pre-COVID era vs 36% during COVID-19 pandemic, without finding statistically significant differences (p = 0.313).

CONCLUSION: Survival after temporary MCS did not get worse significantly during the COVID-19 pandemic. The possibility of short-term MCS should be maintained for cardiogenic shock and other cases of hemodynamic instability.

Comparison MCS before and during COVID

	Time of implant			P value		Time of implant	P value
Pre-COVID-19 2013-Feb 2020 (n = 142)	COV- ID-19 time March 2020- Nov 2020 (n = 25)	Pre-COV- ID-19 2013-Feb 2020 (n = 142)	COVID-19 time March 2020-Nov 2020 (n = 25)				

	Time of implant		P value		Time of implant		P value
Age (years) (mean+ SD)	62 ± 10	66 ± 10	0.069	Support type	118 (83.1%)	19 (76%)	0.566
Male (n, %)	108 (76%)	15 (60%)	0.079	VA-ECMO (n = 137)	24 (16.9%)	6 (24%)	0.536
Indication (n,%)			0.637	Impella CP® (n = 30)	100 (70.4%)	20 (80%)	
Cardiogenic shock	63 (44.4%)	12 (48%)		Percutaneous implant			
Refractory cardiac arrest	16 (11.3%)	4 (16%)		Drugs at the implant	115 (81%)	21 (84%)	0.370
Electrical storm	9 (6.3%)	2 (8%)		Noradrenaline	114 (80.3%)	21 (84%)	0.312
High-risk PCI	17 (12%)	3 (12%)		Dobutamine	51 (35.9%)	5 (20%)	0.108
Postcardiotomy shock	36 (25.4%)	4 (16%)		Adrenaline			
Others	1 (0.7%)	0 (0%)		Time MCS (days)	4.8 ± 5	3.9 ± 4	0.284
pH (mean + SD)	7.13 ± 1	7.23 ± 0.1	0.292	Complications (n,%)	35 (24.6%)	7 (28%)	0.096
lactate (mmol/L) (mean + SD)	6.03 ± 5	6.8 ± 5	0.495	Vascular (bleeding, ischemia)	59 (41.5%)	9 (36%)	0.117
				Bleeding (minor or major)	67 (47.2%)	9 (36%)	0.096
				Critical care infections			
LVEF (%) (mean + SD)	28.7 ± 16	21.9 ± 15	0.063	Ischemic/hemorrhagic stroke	9 (6.3%)	2 (8%)	0.220
Right ventricle dysfunction (n,%)	68 (47.9%)	20 (80%)	0.005	Renal replacement therapy	36 (25.4%)	4 (16%)	0.136
				Tracheostomy	23 (16.2%)	5 (20%)	0.547
				Encephalopathy	14 (9.8%)	6 (24%)	0.023
Preimplant cardiac arrest (n,%)	68 (47.9%)	12 (48%)	0.364	Survival at discharge (n,%)	62 (43.7%)	9 (36%)	0.313
Cardiac arrest duration (min) (n,%)	28.7 ± 23	29.8 ± 23	0.880				