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EDITORIAL

ECPR . . . Ready for it?

ECMO-RCP. . . ¿Estamos listos?

In this issue of Medicina Intensiva, Martínez-Martínez et al. present the most extensive series of cardiac arrest patients treated with extracorporeal cardiopulmonary resuscitation (ECPR) in Spain.[1] In this retrospective single-center study, 54 patients received ECPR over four years. At the 180-day mark, 16 patients (29.6%) were alive, and 15 achieved good neurological performance. Overall, the results described by Martínez-Martínez et al. are comparable with previously published experiences.[2–4]

According to the Extracorporeal Life Support Organization, ECPR is defined as the application of rapid-deployment veno-arterial extracorporeal membrane oxygenation (VA-ECMO) to provide circulatory support in patients in whom conventional CPR is unsuccessful in obtaining a sustained return of spontaneous circulation.[5] Although international recommendations on CPR include ECPR in their algorithms, there are still no universally agreed indications to start ECPR, and even though inclusion criteria vary among studies, the time between cardiac arrest identification, the onset of resuscitation maneuvers, and the start of ECPR are crucial.[6] As with any other aspect of CPR, ECPR is very time-sensitive.

In the performing arts world, it is well known that practice makes perfect, and we think that ECPR is no exception. The existence of ECMO centers, with highly skilled and well-trained ECMO teams, is the cornerstone of an ECPR program. This training should be simulation-based and should not only include in-hospital but also out-of-hospital healthcare professionals who need to implement scoop-and-run policies when managing cardiac arrest patients if an ECPR scenario is possible.[7] Particular attention should be paid to cannulation skills since, as described by Martínez-Martínez et al., cannulation complications can affect up to 25% of the patients. These ECMO centers should work on standard protocols for ECPR management to homogenize aspects like criteria for ECPR initiation. They should also establish appropriate pathways for post-cardiac arrest care in the ECPR setting.[8] Although the available data does not support the broad use of ECPR, the chances of seeing benefits will be scarce if we do not deploy adequate ECMO programs nationwide. The INCEPTION trial, performed in the Netherlands, could be an example of this.[4] This study, published in 2023, failed to demonstrate any differences when comparing conventional CPR to ECPR (16 % vs 20% survival for each group). Still, when analyzing the data, patients were enrolled at ten different cardiosurgical centers served by 12 emergency medical services, and eight out of those ten centers included less than 15 ECPR patients over four years.

Also, due to the complexity of ECPR, initial efforts might need to be directed towards in-hospital cardiac arrest (IHCA). Chico-Carballa et al. reported the first experience of a Spanish IHCA ECPR program during the first year of its implementation at a tertiary care hospital.[9] This retrospective analysis included seven patients. In all cases, bystander CPR was initiated in less than 1 min, and the median time between bystander CPR and advanced ICU CPR was 5 min (IQR 5–10 min) with median low-flow times of 55 min (IQR 36.25–62.5 min). Overall hospital survival was 42.9% (3 patients), and all survivors achieved a good neurological recovery. In Martínez-Martínez et al.'s experience, survival with good neurological outcomes in IHCA was 32% (8 out of 25), whereas in OHCA, 24.1% (7 out of 29).

Although ECPR programs are contributing to increased cardiac arrest survival with good neurological prognosis, the number of patients that die after ECPR is still high, with casualties reaching 70–85% according to the different published data. The most common causes of death described by Martínez-Martínez et al. in this population were anoxic encephalopathy (17 patients, 51.5%) followed by brain death (10 patients, 30.3%). Ten deceased patients (30.3%) became organ donors after neuroprognostication in their study. Even though this is an undesired outcome, the potential benefits of organ donation are undeniable. ECPR might raise the number of potential donors, either after the determination of death by neurological criteria (brain death) or by circulatory criteria (both uncontrolled and controlled scenarios).[10]

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For this reason, ECPR teams and donor coordination units should all be part of a complex network led by intensivists, with clearly defined roles at each point.

While we wait for further data regarding ECPR results, it seems reasonable to start training and organizing for what the future might bring. Change takes time, and time is something the cardiac arrest patient does not have.

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