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Letter to the Editor

Reply to pre hospital interventions and organ donation in out of hospital cardiac arrest



Dear Editor,

First of all, we would like to thank the ICU team of the Azienda Ospedaliero-Universitaria Careggi Hospital for their contributions and comments and invite them to participate in future research regarding uncontrolled donation after circulatory death (uDCD).

The ERC 2021 recommendations emphasize the importance of measuring and interpreting not only the isolated ETCO₂ values but also the trend during the whole cardiopulmonary resuscitation (CPR).¹ In our study we recollected the capnometry values at start point, midpoint and at transfer, as well as we considered the ETCO₂ trend, in patients, who suffered an unexpected and witnessed out of hospital cardiac arrest (CA),² measured as the difference between the values at transfer and at start point. The detection of ETCO₂ values, in the patient in CRP, should be performed once the airway is isolated, by endotracheal intubation³ and this was performed in our study.

However, once the advanced CPR have been exhausted and the possibility of spontaneous circulation resuming has been ruled out and the patient is considered a potential uDCD, we believe that the purpose of ETCO₂ is to test the viability of the organs being a surrogate marker of the existence of metabolic activity in them.⁴

There are multiple variables that can influence the recovery of spontaneous circulation⁵ and the evolution of future organs for transplantation⁶ in a patient with CRP, one of which is ETCO₂.

Several factors can cause variations in ETCO₂ values at the time of CPR. In addition to being a useful tool for monitoring the quality of CPR through the depth and frequency of chest compressions, ETCO₂ can be influenced by ventilation, blood volume status and drugs.^{7,8} We are currently studying the influence of out-of-hospital CPR administration of drugs such as adrenaline and bicarbonate, together with modes of ventilation, on ETCO₂ values and the evolution of renal grafts. In addition, analytical values such as lactate levels⁹ are also being considered as possible predictors of renal graft outcome. We hope to be able to publish all these results soon.

In certain European countries, such as Spain, France or Italy, the uDCD is a highly developed program and a worldwide reference. One of the main problems of this program is the organizational complexity and the structural and legislative differences between the different countries.¹⁰

In addition, the uDCD presents other challenges compared to other programs, such as the importance of reducing warm ischemia times and the time of organ preservation.

One of the peculiarities of Spanish legislation is that the “No touch period” is only 5 minutes, within the limits established by the WHO in its guidelines, between 2 and 5 minutes.¹¹ Therefore, ischemia reperfusion damage could be reduced compared to times in other countries, improving the warm ischemia time, which is fundamental in the uDCD program.

The programs of many uDCD centers include extracorporeal membrane oxygenation (ECMO) circulation before organ procurement. In most cases, isolated hypo or normothermic abdominal perfusion is performed, with a tendency to the latter in renal transplantation. In the case of ex vivo preservation, it is performed under hypothermia and the use of ECMO should be evaluated both to increase survival and to increase potential donors.^{12,13}

Author contributions

Carlos Rubio, Alonso Mateos, Francisco José Del Río and Amado Andrés were responsible for drafting respond to the letter.

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Ethical responsibilities

All the authors agreed to maintain the confidentiality and respect the rights of the patients in the author responsibilities document, in accordance with the publication and transfer of rights to Resuscitation.

CRedit authorship contribution statement

Carlos Rubio-Chacón: Conceptualization, Formal analysis, Investigation, Methodology, Resources, Writing – original draft, Writing – review & editing. **Alonso Mateos-Rodríguez:** Investigation, Methodology, Supervision, Writing – review & editing. **Fernando Neria-Serrano:** Investigation, Methodology, Software, Supervision. **Francisco Del Rio-Gallegos:** Investigation, Resources, Supervision, Writing – review & editing. **Amado Andrés-Belmonte:** Conceptualization, Investigation, Supervision, Validation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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