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Letter to the Editor

Higher survival chances of hypothermic vs. normothermic cardiac arrest patients with ECLS re-warming



Sir,

Swol et al.¹ are to be applauded for presenting Extracorporeal Life Support (ECLS) to emergency physicians, who are in the front line in selecting potential ECLS candidates. In the light of a recently published study² we would like to add three aspects in the context of ECLS patient selection in accidental hypothermia.

The first parameter is the **no-flow duration**. The authors state that ECLS is “not offered if the no-flow duration is unknown or prolonged to the extent that brain recovery is doubtful”.¹ In severe accidental hypothermia (<28 °C) the no-flow time where brain recovery is possible can be substantially prolonged (e.g. 20+ min no-flow). Additionally, most often cardiac arrest (CA) has been un-witnessed and the no-flow duration is unknown, e.g. in CA due to avalanche burial, submersion or urban hypothermia. Interestingly, in our study the parameter “un-witnessed CA” (66% of our patients) was not associated with a worse outcome.² As cooling of the body progresses, oxygen consumption of the brain declines and oxygen requirements may be a tenth compared to normothermia, which is also the basis of surgery in deep hypothermic circulatory arrest and the concept of intermittent CPR.³

The same reasoning leads to the second parameter, namely, the **low-flow duration**. In one ECPR study the median CPR-duration was 40 (16–251) min, survival-rate 28.8%.⁴ In our study on hypothermic CA patients, CPR duration was longer, median 120 (85–169) min, nevertheless survival to hospital-discharge was substantially higher (37%).² Low-flow in hypothermic CA ECLS patients is associated with survival, but this link is weaker than in normothermic patients.

Thirdly, **CA rhythm**. The authors mention that ECLS re-warming is indicated in hypothermic patients with refractory VT, this may be misleading.¹ We agree that asystole is a bad prognostic factor in normothermic ECLS patients.⁴ However, in hypothermic CA asystole was the presenting rhythm in 32/139 (23%) of the survivors and was not associated with worse outcome.²

The pathophysiology underlying CA due to accidental hypothermia is very specific, this has justified the development of specific management guidelines.⁵ Swol et al.¹ state that “few risk models tested in patients who underwent ECMO were assessed in patients who received V-A ECLS support in the ED”.¹ Recently we published the HOPE-score, whose main goal is to predict outcome

in **hypothermic** CA patients who are considered for ECLS re-warming.² The HOPE-score may be used in the emergency department (ED) in order to help identify hypothermic CA patients who will most likely benefit from ECPR re-warming. Patients arrested due to hypothermia represent a highly specific subset of ECPR candidates and have high chances of good outcome as compared with normothermic OHCA. The HOPE-score may help to guide decision-making on ECLS installation in hypothermic CA patients in the ED.²

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Conflicts of interest

None.

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