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Letter to the Editor

Estimation of the survival probabilities in hypothermic cardiac arrest patients with drowning: The HOPE score as a tool to help selecting patients for extracorporeal rewarming



To the Editor

We read the excellent review by Bierens et al.¹ with great interest. The authors have made every effort to fill the gaps in the knowledge of drowning. We would like to add some comments, focusing on the specific cases of drowning cardiac arrest patients with hypothermia.

Hypothermia victims may survive with excellent outcome, if properly treated with extracorporeal life support rewarming (ECLSR). Consequently, all victims of drowning in cardiorespiratory arrest who also have significant hypothermia should be evaluated for ECLSR with cardiopulmonary bypass (CPB) or extracorporeal membrane oxygenation (ECMO). However, drowned victims with submersion (where the airways are under the water) have a relatively bad prognosis compared to victims of hypothermic cardiac arrest from cold exposure alone, because of the presence of asphyxia (similarly as it is for avalanche victims with full burial and obstructed airways).

The indication to start ECLSR in a particular patient should be carefully weighted, and based on data that suggest that mechanical cardiorespiratory support in combination with rewarming will increase the chances of survival or quality of life.² The HOPE score (www.hypothermiascore.org) was developed to provide clinicians with a specific prognostic decision tool to guide ECLSR decision of hypothermic cardiac arrest victims. The HOPE score consists of six variables available at hospital admission, and outputs the survival probability at hospital discharge after ECLSR.³ These variables include the mechanisms for hypothermia which was defined as non-asphyxia-related (e.g. immersion, outdoor or indoor exposure to cold) or asphyxia-related (i.e., submersion, avalanche with burial of the head under the snow). The HOPE score provides a prediction of the survival probability in hypothermic cardiac arrest patients undergoing ECLS rewarming. The score ranges from 0% to 100% chance of survival to hospital discharge. A cutoff of 10% to decide which hypothermic patients in cardiac arrest would benefit or not from ECLS rewarming was evaluated in an external validation study.⁴ The negative predictive value of a HOPE score < 10% was of 97%, and the AUC under the ROC curve was of 0.825 which suggest excellent discrimination.

The HOPE score is therefore a tool that may help clinicians when deciding to propose ECLSR using ECMO for hypothermic patients

following drowning. A complete information on the drowning scenario is necessary to appreciate the lifesaving role of hypothermia in each drowning victim. The distinction between immersion and submersion (where the airways are under the water) is, in this context, crucial. This information is however rarely available. Estimation of the survival probabilities using the HOPE score may therefore help decision-making, estimating the survival chances depending on the mechanism, especially if immersion may have preceded submersion, and therefore hypothermia be the most likely cause of CA.

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Conflict of interest

None.

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