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Letter to the Editor

Reply to letter: Neurocognitive and behavioural outcomes in a nearly drowned child with cardiac arrest and hypothermia resuscitated after 43 min of no flow-time: A case study

Sir

The case report by Galbiati et al. reported a favourable outcome for a 15-year-old drowning victim following a 43 min period of (head under water) submersion [1]. We applaud the authors, rescue personal and those involved in his care for their efforts, and for bringing this case to the literature. In addition, we agree with their conclusion that early medical and neuropsychological intervention is important. The reported prolonged period (43 min) challenges the current assumed limits of survival following submersion [2] and, potentially, challenges the current decision making models that guide rescue and resuscitation, and the mechanism(s) by which prolonged survival is possible e.g. Pre-cooling before submersion and cerebral hypoxia, or sudden cardiac standstill before cerebral anoxia (the latter scenario being associated with more favourable outcomes) [3].

The assumption is that survival and extent of neurological outcome inversely correlate to the length of anoxia i.e. period of submersion [2,4]. At the site of incident, rescue personnel must balance the risk to the rescuer versus the victim's chance of survival. This critical decision is incredibly difficult, as there is a moral obligation to act. If the decision making model of Tipton & Golden [4] were applied to this case it would suggest a rescue attempt. The model suggests the "clock starts" once a member of the emergency services is on scene and confirms the submersion, the rationale being the un-reliability of witnesses to record time. In this case, the time of call to rescue was 29 min, thus the time from EMS being on scene confirming submersion to rescue was less than 30 min.

This case may justify a review of decision making models for rescue and resuscitation. Before it does, we invite the authors to submit the specific details that would affect decision making for future similar cases. These include:

1. Under what circumstances did the child find himself submerged in the river? e.g. pre-cooling from swimming/immersion before submersion, clothing worn, pre-existing medical conditions (trauma, seizure, cardiac arrhythmias or structural abnormalities), presence of air-pockets etc.
2. Background to event timings. e.g. incident to time of EMS call, time of call to rescue.
3. The child's height and weight
4. Nature of the river? i.e. fast flowing aerated or slow moving, presence of thermoclines that may affect the temperature in which the child was submerged.
5. The timing, method and location the water temperature was measured.
6. The initial variables that indicated ECLS. i.e. the blood pH, potassium, lactate and whether these were corrected for temperature and P_aCO_2 [5].

The key to such cases can often be found in mundane details. Unfortunately, but understandably, it is these details that often fail to be recorded when the primary objective is resuscitation, or fail to be published due to word limits. We are thereby deprived of the information needed to refine important guidance.

References

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Michael Tipton
Extreme Environments Laboratory, Department of Sport & Exercise Science, University of Portsmouth, Cambridge Road, Portsmouth, UK

Patrick Morgan [a,b,*]
[a] *Extreme Environments Laboratory, Department of Sport & Exercise Science, University of Portsmouth, Cambridge Road, Portsmouth, UK*
[b] *North Bristol NHS Trust, Southmead Hospital, Southmead Road, Bristol, UK*

[*] Corresponding author at: Extreme Environments Laboratory, Department of Sport & Exercise Science, University of Portsmouth, Cambridge Road, Portsmouth, UK.
E-mail address: drpaddymorgan@gmail.com (P. Morgan)

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