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Letter to the Editor

Low incidence of avalanche victims in cardiac arrest calls for multi-centre studies and registries for the validation of resuscitation guidelines



Sir,

A recently published single-centre study in Switzerland has reported a high level of adherence of physician-staffed helicopter emergency medical teams to the current guidelines for the out-of-hospital management of completely buried avalanche victims. Patient management regarding critical decisions was correct in 93% of identified cases. However, despite this exemplary work none of the 66 recorded avalanche victims presenting with cardiac arrest on scene survived.¹ Thirty-one patients (47%) were declared dead on scene, 35 (53%) were admitted to the hospital and seven (11%) underwent extracorporeal life-support. The rescue bases and authors involved should be commended both for the meticulous out-of-hospital and in-hospital data collection and analysis, plus the exceptionally high compliance with treatment recommendations compared with an earlier study.² In this multi-centre study we have shown a lower level of compliance in Austria (1996–2009), which included 170 recorded avalanche victims presenting with cardiac arrest and a higher percentage of long duration burials (67% vs. only 35%). Notably, cardiopulmonary resuscitation was often continued to hospital admission in avalanche victims with short burial and asphyxial cardiac arrest, but withheld or terminated at the scene in those with long burial and possible hypothermic cardiac arrest.²

Recent studies referring to arrested avalanche victim mortality have shown that survival is lower than expected in the past, because most patients will suffocate or die from trauma before they will become cold enough (e.g. <28 °C) to survive a prolonged cardiac arrest. Whereas, avalanche victims with a short duration of burial and cardiac arrest seem to have higher chances of remaining neurologically intact after resuscitation.³

During the observation period of Metrailler-Mermoud's study,¹ the initial recommendations for out-of-hospital management of avalanche victims were adapted twice,^{4,5} whereby the latest ERC recommendations, published in 2015, were not implemented during the observation period. In these current recommendations the cut-offs for duration of burial were changed from 35 to 60 min, core temperature from 32 °C to 30 °C and serum potassium from 12 to 8 mmol/L. Furthermore, a recent study proposed new estimates for the optimal cut-off values for in-hospital triage of arrested avalanche victims: 30 °C for core temperature and 7 mmol/L for serum potassium.⁶ Taking into account these cut-offs, only three out of

the recorded seven patients would have been eligible for extracorporeal rewarming in the presented dataset, which corresponds to 4.5% of all recorded patients. This highlights the increasing specificity of current recommendations, which become more exacting in relation to the aetiology of avalanche arrest.

The observation of these 66 patients took 12 years and six months (2004–2016), which corresponds to an incidence rate of 5.3 cases per year.¹ This is three times lower than the 13 cases per year documented in our previous study.² A higher number of documented cases is needed to reliably validate the current recommendations. This will only be achievable if data collection is collated from multiple centres, or an international registry is envisaged. Multi-centre studies could better assess the impact of education and guidelines on compliance to recommendations and patient outcome.

Conflicts of interest

HB receives grants as the head of the Institute of Mountain Emergency Medicine from EURAC research, Bolzano, Italy. No author has any conflict of interest to disclose.

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