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Letter to the Editor

The futility of resuscitating an out-of-hospital cardiac arrest cannot be summarized by three simple criteria

To the Editor,

We read with great interest the clinical paper written by Globera et al.[1] which suggest three simple criteria (non-shockable initial rhythm, unwitnessed arrest, and age ≥ 80 years) for predicting futile resuscitation of out-of-hospital cardiac arrest (OHCA). In this study, the authors conducted a retrospective analysis of the Cardiac Arrest Registry to Enhance Survival (CARES) database and included 1750 subjects, 223 of whom met all three criteria. In order to assess the external validity of these criteria, we applied them on the French National Cardiac Arrest Registry which counted 85519 OHCAs in March 2018. We have selected a population that meets these three criteria, excluding subjects whose resuscitation had not been undertaken by the Mobile Medical Team (MMT). An MMT consists of an ambulance driver, a nurse, and a senior emergency physician as a minimum team. We therefore included 2481 subjects aged 80 or greater with a non-shockable rhythm and no arrest witnessed. Among them we observed 13.6% of return of spontaneous circulation (ROSC) (n = 339), 7.9% survivors at d0 (n = 196) and 0.8% 95CI [0.5–1.2] survivors at d30 (n = 19). The characteristics of survivors and non-survivors at d30 are compared in Table 1. Electrical asystole was more common in the non-survivor group at d30 as well as a lower maximum value of end-tidal carbon dioxide (ETCO2) during resuscitation. The median time to death before the 30th day was 1 [0–3] day.

We believe that the decision not to undertake resuscitation should be based on a more thoughtful decision than these 3 criteria alone. Indeed, it seems essential to us to consider comorbidities and autonomy. In addition, well-known prognostic factors should also be taken into account, such as the "maximum theoretical no flow duration" (i.e. time without chest compressions between the last presence and the discovery of cardiac arrest), initial cardiac rhythm (asystole or pulseless electrical activity), ETCO2 value, presence of gasping,[2] cardiac standstill on point-of-care ultrasound,[3] etc. We agree with the authors regarding the trauma of families on the receiving end of abusive resuscitation, however, the trauma of the lack of resuscitation should also be assessed. As proposed by Jabre et al.,[4] it seems reasonable in this selected population, whose survival is very low, to limit resuscitation efforts to 3 or 4 mg of adrenaline. Indeed, in our population from the RéAC database, only one survivor on d30 with the 3 criteria of Globera et al. received more than 4 mg of adrenaline, which represents 0.04% 95CI [0.00–0.25] of subjects; is it a low enough rate to be acceptable by civil society? The termination-of-resuscitation (ToR) is an important decision that should be the result of careful consideration and not be made based on a single element or a "too simple" rule as explained by Bossaert et al.[5] in the ethics of resuscitation and end-of-life

Table 1 – Patient characteristics by outcome.

	Survivors at d30 (n = 19)	Deaths before d30 (n = 2462)	*P* Value
Median age [IQR]	84 [83–88]	84 [82–87]	0.7
Female, n (%)	6 (32)	1065 (43)	0.3
Arrest at home, n (%)	15 (79)	1974 (80)	0.8
Medical history, n (%)			
Cardiovascular disease	12 (63)	1414 (57)	0.6
Respiratory disease	5 (26)	384 (16)	0.2
Diabetes	1 (5)	358 (15)	0.5
Neurologic disease	1 (5)	123 (5)	>0.9
Cancer	0 (0)	150 (6)	0.6
Median time to MMT arrival, min [IQR]	15 [11–24]	18 [13–25]	0.2
Initial rhythm recorded by MMT, n (%)			<0.001
Asystole	13 (68)	2337 (95)	
PEA	6 (32)	125 (5)	
Maximum ETCO2 value during CPR, mmHg [IQR]	40 [33–52]	19 [10–33]	<0.001

decisions section of the 2015 guidelines. It is also mentioned that in a context of OHCA, success rates of less than 1% still justify the resuscitation effort.[5]

Conflicts of interest

The authors have no conflict of interest to declare.

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