Prognostic prediction model of cardiac arrest in elderly people based on prehospital and on-arrival factors: A nationwide registry-based study

Trauma and Emergency Medical Center, Medical Hospital of Tokyo Medical and Dental University

Kanae Ochiai, Nagisa Kato, Yasuhiro Otomo

Emergency Department, Hiroshima Prefectural Hospital

Toshiki Sera

COI Disclosure Information

Kanae Ochiai

I have no financial relationships to disclose

Background

- Potential for resuscitation of elderly people is not clear.
- Physical background before onset varies **among** individuals.

Methods

Patients: Japan Association for Acute Medicine OHCA registry

06/2014-12/2016 Age ≥ 75

Pre-hospital factors: sex, age, dispatch of doctor car, witnessed

collapse, bystander CPR, initial rhythm, intubation, drug

administration, ROSC, and transport time

Factors on hospital arrival: consciousness level, rhythm on arrival,

induction of ECMO, TTM, CAG, adrenalin administration, ABG

measurements, laboratory data, and logit of prehospital factors

Primary outcome: neurological outcome 30 days after ROSC

Secondary outcome: survival to 30 days after ROSC

Abbreviations

OHCA: out of hospital cardiac arrest
CPR: cardiopulmonary resuscitation
ROSC: return of spontaneous circulation
ECMO: extracorporeal membrane oxygenation
TTM: targeted temperature management

CAG: coronary angiography
PEA: pulseless electrical activity
ABG: arterial blood gas
GCS: Glasgow coma scale

Results

Neurological
outcome
30 days
after ROSC

Survival to
30 days after
ROSC

Prehospital factors	n=6,405	Factors on hospital arrival	n=6,405
Age median [IQR]	84 [79, 88]	GCS median [IQR]	3 [3, 3]
Male n (%)	3,374 (52.7)	Rhythm Shockable n (%)	157 (2.3)
Dispatch of doctor car n (%)	712 (11.1)	on arrival PEA	1,364 (21.3)
Witnessed Yes n (%)	2,636 (41.2)	Asystole	4284 (66.9)
Bystander CPR Yes n (%)	2,735 (42.7)	ROSC	609 (9.5)
Initial rhythm Shockable n (%)	288 (4.5)	Unknown	1 (0.0)
PEA	1,586 (24.8)	ECMO n (%)	68 (1.1)
Asystole	3,743 (58.4)	CAG n (%)	203 (3.2)
Other	788 (4.1)	TTM n (%)	214 (3.3)
Unknown	527 (8.2)	Epinephrine n (%)	5,138 (80.2)
Intubation n (%)	2,845 (44.4)	pH median [IQR]	6.90 [6.78, 7.03]
Drug administration n (%)	2,389 (37.3)	Lac median [IQR]	116 [85, 153]
ROSC n (%)	666 (10.4)	Serum creatinine median [IQR]	1.1 [0.8, 1.6]
Transport time median [IQR]	33 [27, 40]	Serum total protein median [IQR]	5.9 [5.4, 6.5]
Cause cardiogenic n (%)	3,478 (54.3)	Serum albumin median [IQR]	3.0 [2.5, 3.4]
cerebrovascular	162 (2.5)	30-day survival n (%)	375 (5.9)
respiratory/asphyxia	1,145 (17.9)	30-day favourable	131 (2.0)
trauma/drowning	455 (7.1)	neurological outcome n (%)	
other	1,165 (18.2)		

Prehospital factors	Odds Ratio	Confidence Interval
Age	0.934	0.878-0.994
Initial rhythm	0.357	0.262-0.487
Drug administration	0.094	0.033-0.274
ROSC	113.258	39.718-322.961
Transport time	0.959	0.933-0.987

Factors on arrival	Odds Ratio	Confidence Interval
CAG	7.544	3.500-16.260
pH	23.417	2.061-266.013
Albumin	1.945	1.035-3.655
Logit of prehospital factors	2.016	1.662-2.446

Prehospital factors	Odds Ratio	Confidence Interval
Age	0.945	0.914-0.977
Witnessed	1.584	1.055-2.377
Initial rhythm	0.567	0.473-0.679
Drug administration	0.409	0.271-0.617
ROSC	34.180	22.826-51.182
Transport time	0.951	0.934-0.969

Factors on arrival	Odds Ratio	Confidence Interval
GCS	1.259	1.022-1.552
Rhythm on arrival	0.655	0.561-0.765
CAG	3.222	1.642-6.323
TTM	8.310	4.460-15.484
pH	12.836	3.553-46.634
Total protein	1.570	1.235-1.995
Logit of prehospital factors	1.302	1.170-1.448

Conclusion

We identified multiple factors associated with neurological and survival outcomes at 30 days after ROSC.