Survival following treatment of out-of-hospital cardiac arrest in a physician-manned prehospital emergency system with immediate access to a cardiac catheterization laboratory

Background

Survival following out-of-hospital cardiac arrest (OHCA) varies nationally¹ and internationally². Across all cases of OHCA, survival to discharge from hospital is reported as less than 10% ¹.

In the area of Odense, Denmark (population 260.000), patients with OHCA are treated by a prehospital anaesthesiologist-manned mobile emergency care unit (MECU). Following resuscitation from OHCA of suspected cardiac origin, patients are transported directly to the cardiac catheterization laboratory (Cathlab) at a specialized tertiary centre.

The response time of the unit is 8 minutes.

The median time from patient contact to arrival at the hospital is 36 minutes.

Methods

Manual review of all prehospital medical records of patients treated by the MECU from 2011-2016.

Patients declared dead by the MECU physician immediately upon arrival were excluded.

Primary outcome was survival at 30 days. Secondary outcomes were patient transported or declared dead, ROSC at any time, and survival at 24 hours.

Results

900 patients (67.3% male) with OHCA were treated by the MECU.

In 484 patients (53.8%), treatment was terminated on scene, and the patient was declared dead before transport.

416 patients (46.2%) were transported to hospital.

379 patients (42.1%) had ROSC.

286 patients (31.8%) were alive at 24 hours.

164 patients (18.2%) lived at 30 days.

Adjusted according to the size of the population of the catchment area, survival figures translated to 24.3 patients achieving ROSC, 18.3 survivors at 24 hours, and 10.5 survivors at 30 days per 100.000 inhabitants/year.

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Outcome following out-of-hospital cardiac arrest

	Total / six years ((% 95%CI))	Per 100.000 inhabitants / year
Cardiac arrests	900	57.7
Declared dead at the scene	484 (53.8% (50.5% - 57.1%))	31.0
Transported to hospital	416 (46.2% (42.9% - 49.5%))	26.7
Patients with ROSC	379 (42.1% (38.9% - 45.4%))	24.3
Patients alive at 24 hrs.	286 (31.8% (28.7% - 34.9%))	18.3
Patients alive at 30 days	164 (18.2% (15.8% - 20.9%))	10.5

Discussion

Following resuscitation from OHCA, the Cathlab is immediately alerted. Resuscitated patients are treated with thrombolytics and transported directly to the Cathlab for finalising treatment, avoiding unnecessary delay in the emergency department or the wards.

Establishing a system where delays are reduced both regarding to the initial treatment, transportation, and finalising treatment allows for survival rates considerably better than the average.

Conclusion

Physician-directed treatment of OHCA in a prehospital emergency system working in close collaboration with a tertiary centre with a 24/7/365 cardiac catheterization service may result in higher survival rates than generally reported from western countries.

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