Effects of fire-fighters as first responders in out-of-hospital cardiac arrest: A study of a selective dispatch system in Skåne County, Sweden.

Andréll, C.,^{1,2} Dankiewicz, J.,^{1,3} Todorova, L.,⁴ Olanders, K.,² Ullén, S.,⁵ Friberg, H.^{1,2} ¹Center for Cardiac Arrest, Lund University, Lund, Sweden | ²Skåne University Hospital, Department of Anesthesiology and Intensive Care, Lund, Sweden | ³ Skåne University Hospital, Cardiology, Lund, Sweden | ⁴Office of Medical Services, Department of Clinical Science | ⁵Clinical Studies Sweden – Forum South, Unit for Medical Statistics and Epidemiology, Skåne University Hospital

Background

Out-of-hospital cardiac arrest (OHCA) is a time-critical condition.¹ The first responder function aims to shorten no-flow time and increase the chance for early defibrillation.²

Aim

To study outcomes of shockable rhythm and 30-day survival after out-of-hospital cardiac arrest in a selective dispatch system.

Skåne County, Sweden (11,035 km² and 1.3 million inhabitants) implemented a selective dispatch system for fire-fighters as first responders in 2005. The two nearest available ambulances are dispatched in suspected OHCA (dual dispatch), and *in case of a presumed time gain, fire-fighters are dispatched as first responders*. Our hypothesis was that the group with first responder dispatch had a higher proportion of shockable rhythm (primary outcome) and improved 30-day survival (secondary outcome) compared to ambulance dispatch alone.

Methods

Data (n=4681) from the Swedish Cardiac Arrest Registry for Skåne County, Sweden (2010-2016) were merged with emergency medical dispatch data. *Inclusion:* ≥ 18 years, dispatched as a suspected cardiac arrest *and* non-EMS-witnessed. Valid data were divided in two groups: First responders first on scene (FR first) vs. two ambulances dispatched (AMB only, figure 1). McNemar's test was used to analyse the matched pairs, matched by ambulance response time (±2 min.), age group (18-39, 40-59, 60-79, ≥ 80) and witnessed cardiac arrest (yes/no).

Results

From a total of n=4681 patients, n=1179 were excluded due to invalid data, n=1045 did not fulfil inclusion criteria, leaving n=2457 patients divided into two groups (figure 1). A successful match was performed in 564 cases. Group *FR first* demonstrated lower frequency of bystander CPR (61.2% vs. 69.0%) and more hospital admission (59.0% vs. 54.2%). Within the group *FR first*, the median response time for dispatched vehicles was 5.2 minutes shorter for first responders compared to the ambulance (figure 2).

The 30-day survival in FR first group was 8.7% vs. 8.5% in AMB only group, p=1.00. Due to missing data, results of shockable rhythm could not be analysed.

Conclusion

The 30-day survival was similar regardless of whether or not first responders were first on scene in a matched analysis.

First responder dispatching shortened response times. Further analyses of this selective first responder model in Skåne County, Sweden are needed.

Contact

cecilia.andrell@med.lu.se

Center for Cardiac Arrest, Lund University, Sweden
med.lu.se/cardiacarrest – @ResusLund

References

¹Larsen et al. Predicting survival from out-of-hospital cardiac arrest: a graphic model. *Ann Emerg Med* 1993; 22:1652-8 ²Saner et al. Dual dispatch early defibrillation in out-of-hospital cardiac arrest in a mixed urban-rural population. *Resuscitation* 2013; 84:1197-202