Time to First Compression During Dispatcher-Assisted CPR is Not Associated with ROSC or Survival to Discharge

Lee M. Van Vleet MHS, NREMT-P  
Wake County EMS, Raleigh, NC

Michael Bachman MHS, NREMT-P  
Wake County EMS, Raleigh, NC

Michael Hubble PhD, NREMT-P  
Western Carolina University, Cullowhee, NC

Background

- Rapid delivery of uninterrupted chest compressions is a key component of successful resuscitation.
- Without bystander CPR, cardiac arrest survival decreases 7%-10% for every minute of delay until defibrillation.
- Dispatcher-assisted CPR increases the rate of bystander CPR and cardiac arrest survival.
- While there are uncontrollable barriers to the delivery of dispatcher-assisted CPR, the time to first compression (TTFC) remains a potentially modifiable component of the EMD-caller interaction. However, the effect of the TTFC on ROSC and survival to discharge is largely unknown.

Wake County, NC, is a mixed urban/suburban county encompassing 831 square miles with a 2014 population of approximately 1 million residents. Approximately 90,000 EMS calls answered in 2014. Approximately 1,500 basic life support firefighter first responders with an estimated mean response time of 5 minutes.

EMS calls are answered in 9.6 (± 4.1) minutes. Mean TTFC was 4.1 (± 1.6) minutes and mean EMS response time 9.6 (± 4.1) minutes.

Methods

Retrospective review of all non-traumatic 911 calls receiving CPR Pre-Arrival Instructions from December 2005 to February 2014.

- Audio recordings of each call were reviewed by an EMD QA officer to determine TTFC.

Other data abstracted from EMS reports:

- Initial ECG
- Final Airway
- Witnessed or not
- Patient demographics
- ROSC
- Survival to discharge

Data were modeled using logistic regression with p≤0.05 indicating significance.

Results

- Complete data were available for 609 cases.

- The mean patient age was 58.7 years and 61.5% of patients were male.

- A shockable rhythm was the initial rhythm in 21.7% of cases and 43.5% of arrests were witnessed.

- Mean TTFC was 4.1 (± 1.6) minutes and mean EMS response time 9.6 (± 4.1) minutes.

- Significant predictors of ROSC included age (OR=0.98) and shockable rhythm (OR=1.95), while significant predictors of survival to discharge included minority status (OR=1.96), witnessed arrest (OR=5.0), and shockable rhythm (OR=6.7). Compared to BVM only, patients receiving BIAD (OR=0.11) and ETI (OR=0.15) were less likely to survive to discharge. (Table 1)

- TTFC ≤ 3 minutes was not a significant predictor of ROSC or survival to discharge. (Table 1)

Conclusions

Within the limitations of our study design, we found that patients with a TTFC of ≤3 minutes were no more likely to achieve ROSC or survive to hospital discharge than patients with longer TTFC. Additional study is needed to determine ideal TTFC goals.