Time-to-First-Compression and Barriers to Dispatcher-Assisted Cardiopulmonary Resuscitation

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BACKGROUND

Rapid identification of out-of-hospital cardiac arrest (OHCA) and delivery of bystander chest compressions in patients with ventricular fibrillation are key elements in the chain of survival. The timeliness of dispatcher-assisted CPR may improve survival in such patients. The Medical Priority Dispatch System (MPDS®) has recently introduced a streamlined process for emergency medical dispatchers (EMDs) that provides early identification of OHCA and rapid delivery of chest compression instructions in version 13.0, known as the Obviously Unconscious Chest Compressions (OCC) feature.

METHODS

Design
A retrospective, observational study of audio files for 76 cases where (compressions only pathway) dispatcher-assisted cardiopulmonary resuscitation (DA-CPR) using MPDS v13.0 was performed.

Setting
Case audio was downloaded from emergency medical dispatch systems for two IAED Accredited Centers of Excellence (ACE) agencies: EMSA, Oklahoma, USA; Montgomery County, Texas, USA.

Outcome Measures
- Elapsed time to start of dispatcher CPR instructions.
- Elapsed time to bystander-initiated chest compressions or Hands-On-Chest (HOC).
- Barriers that impeded progress of bystander delivery of prompt chest compressions.

RESULTS

A total of 76 audios were evaluated, of which 39.5% (n=30) utilized the Fast Track feature and 74.2% (n=55) experiencing a barrier. Overall, the median time to start of dispatcher CPR instructions (after the time of address acquisition) was 111 seconds for Fast Track cases and 147 seconds for non-Fast Track cases. The overall median time to bystander initiated Hands-On-Chest (HOC) was 165 seconds for Fast Track cases, and 195 seconds for non-Fast Track.

The presence of barrier drastically changed this reality, where Fast Track cases with no barriers had a median time to start of dispatcher CPR instructions of 56 seconds (Fig. 1; Table 1), and a median time to bystander CPR of 101 seconds. In contrast, Fast Track cases with 1 or more barriers had a median time to bystander CPR of 138 seconds. Overall, non-Barrier calls had a median time to the start of dispatcher CPR instructions of 94 seconds, and 119 seconds for bystander initiated CPR (Fig. 1; Table 1).

The most common Patient-related barrier was “Patient on bed” (n=16, 21.1%), followed by “Patient on couch/ chair” (n=8, 10.3%) (Fig. 2), whereas the most common Caller-related barrier was “Caller hysterical” (n=14, 18.4%) followed by “Caller uncooperative” (n=12, 15.8%). Overall, the median time to bystander initiation of chest compressions steadily increased as the number of barriers encountered increased, with 166 seconds for 1 barrier (n=30), 211 seconds for 2 barriers (n=14), 231 seconds for 3 barriers (n=9), and 327.5 seconds for 4 barriers (n=2); no barriers having a median HOC time of 119 seconds (n=20) (Fig. 3).

DISCUSSION

Over 70% of all bystander initiated chest compression cases experienced a delay in the time to Hands-On-Chest due to extraneous barriers whether Caller-related or Patient-related, or both.

Cases that utilized Fast Track feature had drastically reduced median times to bystander initiation of chest compressions; however, not all agencies have policies in place that require this feature, and not all calls are eligible to utilize the Fast Track feature. The Fast Track feature is meant to be used where the caller immediately describes the patient as unconscious and not breathing. Otherwise, the emergency medical dispatcher must first diagnose the breathing status and consciousness of the patient.

CONCLUSIONS

Use of the MPDS v13.0 Fast Track feature improves time to first compression, as compared to cases that did not employ this feature. Many cases experienced a barrier, if not multiple, that impeded time to bystander delivery of life-saving chest compressions. A significant difference exists in the time to compressions delivered between cases with no barriers and those with barriers.

Getting the patient from the bed to the floor was the most common Patient-related barrier encountered, whereas hystera was the most common Patient-related barrier encountered.

Overall, DA-CPR from a trained and certified EMD using a scripted protocol reduces the time to bystander initiation of chest compressions and is critically important in patient safety and survival outcomes.

Future studies that evaluate DA-CPR should identify these barriers and report on how they impacted elapsed times – as well as whether a Fast Track feature was utilized to engage Hands-On-Chest earlier.

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