



Out-of-hospital cardiopulmonary resuscitation: a position statement of the Lebanese Society of Cardiology and the Lebanese Society of Emergency Medicine

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Abstract: Out of hospital cardiac arrest (OHCA) is a leading cause of death worldwide. Early cardiopulmonary resuscitation (CPR) and early defibrillation are key to improving outcomes of patients with OHCA including return of spontaneous circulation (ROSC) and survival to hospital discharge with good neurologic outcomes. Lebanon like other developing countries, suffers from absence of organized prehospital cardiac arrest care bundle and from absence of a legal framework for community involvement in cardiac arrest care. Scientific societies, involved non-governmental organizations (NGOs) and local governmental stakeholders organized a national meeting to launch a strategy aiming at improving OHCA outcomes in Lebanon. This article represents a position statement of the Lebanese Society of Cardiology and the Lebanese Society of Emergency Medicine summarizing the strategy to improve out-of-hospital CPR. Participating stakeholders developed and submitted a law proposal of a “Good Samaritan Law” to the Lebanese parliament. Several of activities were also launched aiming at establishing public access defibrillation programs and at training bystanders in different areas in Lebanon to perform bystander CPR and use automated external defibrillators (AEDs). Additional recommendations were proposed to local emergency medical system (EMS) agencies to improve prehospital care and introduce medical direction to prehospital activities.

Keywords: Cardiac arrest; Lebanon; community

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Cardiac arrest, a leading cause of death worldwide, is recognized when there is loss of circulation. The key to ensuring return of spontaneous circulation (ROSC) and survival of arrest victims is to initiate cardiopulmonary resuscitation (CPR) as soon as possible, since lack of blood supply to the brain for 4 to 6 minutes may lead to irreversible brain damage. Prompt CPR is challenging if the arrest happens out of hospital (1). Studies have shown that survival rates of out of hospital cardiac arrests (OHCA) till hospital discharge range from 0% to 30.5 % (2), including 10.4% in the US, with lower survival rates reported in developing countries (1,3). In Lebanon, survival rates of OHCA victims were reported at 4.8% to 5.5% with close half the survivors (45.4% to 53.8%) demonstrating good neurologic outcomes (4,5).

The American Heart Association (AHA) provided evidence based guidelines for improving survival of OHCA victims in the form of a chain of survival, addressing the roles of lay people in recognizing the arrest and activating the emergency response team, providing immediate high-quality CPR and rapid defibrillation with an automated external defibrillator (AED) until the emergency medical system (EMS) personnel arrive. The next step is transport of the victim and continued resuscitation by the EMS till arrival to the hospital where advanced life support and post arrest care is provided (6). In addition to the significant impact of bystander CPR on OHCA survival, the AHA reported improved OHCA survival rates by 9% to 14% if bystanders used AED, and up to 29% in case of witnessed arrests (7). Moreover, significant improvement in survival rates were noted when EMS activation was prompt, with ROSC before hospital arrival a prerequisite for survival to hospital discharge.

In Lebanon, a country located in the Middle East with a population around 4.5 million; there is neither national EMS guideline nor a national policy on CPR for OHCA victims. Moreover, there is no equivalent to a "Good Samaritan law". The currently existing regulation governing assisting people in medical distress is under Criminal Law 567 (Nations, 2017). This law states that if a person does not assist an individual in need of help then the former person is liable to legal prosecution. Research done in Lebanon clearly showed that this form of regulation is not achieving the target of increasing bystander CPR. To the contrary, observational studies have shown that there is significant reluctance to initiate CPR because of fear of possible subsequent legal prosecution and the rate of bystander CPR is very low (4.2% to 4.4%) (5).

Despite the above, numerous non-governmental organizations (NGOs) (Remy Rbeiz Foundation, Yohan Foundation and CHAMPS Fund), that were founded by parents of young victims of sudden cardiac arrest, took it on their shoulders to: (I) train individuals on how to perform CPR, (II) perform screening electrocardiograms (EKG) following the European Society of Cardiology recommendations for athletes in schools despite, and (III) when possible deploy publicly accessible automated defibrillators at schools or universities. EKG screening is a core activity of these NGOs despite local research reporting on very low prevalence of potential lethal inherited arrhythmias in asymptomatic school children (8). Moreover, these NGOs lobbied within the Lebanese Order of Physicians (LOP) to issue a clear memo in favor of public access defibrillators, and worked very hard to introduce CPR into school curricula. While all these efforts are welcomed, they remained fragmented and not within a comprehensive plan that is developed, supported and endorsed by governmental bodies and organizations that can provide medical oversight. In particular there is no national strategy to deploy AEDs across the country as part of a public access defibrillation (PAD) program linked to a PAD agency. Accordingly, it is not surprising that the rate of use of AEDs is rare (0.9%) (5).

One step downstream to bystander CPR, data showed that transport by emergency medical services occurs for the majority of OHCA cases (71.5% to 75.6%) (4,5). Basic CPR is usually provided by EMS providers while en route to hospital. A survey of 258 prehospital providers (9) showed that the main barriers to resuscitation success for OHCA victims were delays in calling EMS (84.4%), traffic delays in reaching the victim (72.1%) that lead to delay in initiating CPR (30%) and delay in defibrillation (20%). Very recently, the Civil Defense (a Lebanese emergency response service provider) received a donation and acquired motorcycle ambulances. As this happened only very recently, no data currently exists to show advantage in terms of cutting down response time. This response time is reported to be on average 12 minutes during the daytime and 9 minutes at night by the Red Cross in a sample of 2,313 cases in 2018–2019.

Consistent findings in surveys of emergency physicians (10) and prehospital providers (9) include recommendations to develop a national policy on resuscitation of OHCA victims, provide awareness campaigns and community training in CPR, deploy AEDs in public places across the country, and advance the scope of practice of EMS personnel so they can provide advanced cardiac life support in ambulances. Finally,

a study of 948 university students showed willingness to do CPR in the community; however, limited knowledge of CPR (56.4%), fear of injuring the patient (53.5%), fear of contracting an infection (30.3%) and lack of training (20.3%) were barriers to performing CPR (11).

Recommendations

Based on the above, the Lebanese Society of Cardiology (LSC) and the Lebanese Society of Emergency Medicine (LSEM) organized a 1-day conference at the LOP, March 30th 2019, where all stakeholders were invited for information dissemination and the creation of a clear plan forward. The stakeholders included: the chairman and an active member of the health committee at the Lebanese Parliament; the president of the Lebanese Syndicate of Lawyers; a representative of the Ministry of Health; the NGOs involved in community outreach activities; the Vascular Medicine Program at the American University of Beirut Medical Center; and the president of LOP, in addition to presidents and members of both societies. The outcomes of this conference were:

- ❖ Amendment of Criminal Law 567 to include at its end a section that states the following: any person who, in good faith and without financial compensation, shall be exempted from any penalty for attempting to provide medical care to subjects of cardiac arrest outside the hospitals, with CPR and using automated electrical defibrillator and the like, for example. This amendment was officially submitted to the Lebanese Parliament for approval on May 28th, 2019.

Furthermore, the participants believe the following strategies must be put in place:

- ❖ Launching a public awareness campaign about CPR and AED use, with messages, videos and educational material that show the importance of early recognition of cardiac arrest and what needs to be done to improve survival of the victims;
- ❖ Making AEDs available in most public places in Lebanon as part of a comprehensive PAD program. This program must be overseen and linked to PAD agency. Furthermore, critical assessment of areas of deployment must be considered to avoid mismatch between OHCA sites and PAD location;
- ❖ Mandating basic CPR training, including the use of AEDs in high schools;
- ❖ Training lay people in the community in CPR and

on the use of AEDs;

- ❖ Mandating medical direction of Emergency medical services activities (prehospital care standards related to response time, prehospital treatment protocols and overall response strategy to OHCA);
- ❖ Developing a national policy to organize OHCA resuscitation that addresses:
 - ♦ Development of an OHCA registry that includes descriptive characteristics of the victims and outcomes of resuscitation for monitoring and quality improvement;
 - ♦ Advanced training of EMS personnel in resuscitation and defibrillation;
 - ♦ A critical assessment of services provided by current EMS to determine areas of improvement;
 - ♦ Development of train the trainer system for telephone CPR.

A follow-up meeting will be held within 1 year to assess progress and address barriers.

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Footnote

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