Early Chest Compressions Applied to an Out-Of-Hospital Cardiopulmonary Arrest Case by an Untrained Savior

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Received Date: January 13, 2016, Accepted Date: August 08, 2016, Published Date: August 18, 2016.

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Abstract
Recognizing arrest victim, starting early chest compressions, activating the emergency medical services and knowing the steps of Basic Life Support especially the chest compression for bystanders who witness the sudden collapse of an adult will have positive effects on the mortality of out-of-hospital cardio-pulmonary arrest cases. In present case we discussed a cardiopulmonary arrested patient to whom cardiopulmonary resuscitation was applied by an untrained savior.

Keywords: Cardiopulmonary Resuscitation; Untrained; Savior; Out-of-hospital

Introduction
Out-of-hospital cardiac-arrest (OHCA) is one of the most important causes of survival of death worldwide [1]. Early bystander cardiopulmonary resuscitation (CPR) is the foundation for successful cardiac arrest resuscitation. Unfortunately, the majority of persons who have had cardiac arrests do not receive bystander CPR before arrival of professional rescuers. In comparison with traditional chest compression plus rescue breathing, chest compression alone is a CPR strategy that simplifies the psychomotor requirement and may enable easier training and more widespread implementation. However, the long-term survival effects of chest compression alone versus compression plus rescue breathing among bystanders in a generalizable community setting is uncertain [2]. Resuscitation for the chain of survival includes early arrest recognition and emergency activation, early CPR; early defibrillation, expert advanced life support, and integrated post-resuscitation care [3]. Early CPR performed by layperson can double the chances of survival and provides an important foundation for subsequent links in the chain of survival [4].

In present case, we wanted to emphasize the importance of early bystander cardiopulmonary resuscitation and the successful of early chest compression without rescue breathing for out-of-hospital cardiac-arrest.

Case Report
An 85 year-old female patient who became bedridden after a lumbar hernia operation about 75 days ago was found unconscious at her home in the morning by her caregiver. She was followed for hypertension and COPD for 30 years. The caregiver who realized that the patient was not breathing and had no pulse, turned her supine position, prevent the tongue escape back and began to chest compressions. She directed a second person to call 112 emergency medical services (EMS); and pressed as quickly as possible and deeply with the palm of both hands after placing the mid-point of the sternum. Caregiver did not check the pulse during compressions. About ten minutes after the chest compressions patient started breathing. At this time patient’s radial artery pulse was be able to be taken clearly. EMS arrived to the scene and ventilated the patient. The patient arrested in ambulance again and chest compression was performed by EMS attendants for four minutes. The caregiver has learned chest compression by watching a doctor who performed CPR previously just once. During the entrance to the emergency room the patient's O₂ saturation was 83%, blood pressure was 80/40 mmHg, electrocardiogram (ECG) sinus bradycardia (36 beats/min). Laboratory examination WBC 14 × 10^9/L, Pro-BNP 192.3 pg/mL, Troponin: 0.103 ng/mL Urea: 115 mg/dL, D-dimer 33.6 mg/ml; arterial blood gas pH 7.425, PCO₂ 29 were identified. The airways of patients were controlled and cardiac monitoring was provided. 0.5 mg intravenous atropine was administered twice, Combivent nebul 4 × 2 and O₂ 6 L/min was given. Left ventricular ejection fraction was 55%; second degree tricuspid valve insufficiency was detected in echocardiography. The right ventricular cavity was in normal limits. Thrombus in both main pulmonary artery and its branches were observed by thoracic CT angiography. Deep vein thrombosis of right lower extremity was detected by color Doppler ultrasonography. Brain CT showed no pathology. Patient was admitted to the coronary care unit with the diagnosis of pulmonary embolism, and syncope. Due to the recent operation history, thrombolytic therapy could not initiate. Patient was followed by heparin infusion. The overall situation improved and the patient was discharged four days later. In the patient, abnormality of coagulating fibrinogenalysis system was not checked and anticoagulation therapy after discharge was not performed because the presence of important contraindications.

Discussion
The ratio of CPR performed by bystander to cardiac arrest patients is not low in most communities. Bystanders performed CPR to approximately half of cardiac arrests patients before the professional rescuers arrived [4]. The majority of CPR that is performed by untrained saviors consists of chest compressions only. But the traditional CPR comprises both chest compressions and rescue breathing. It is much easier and sometimes more useful to initiate chest compressions only than traditional CPR for OHCA [5]. This idea is supported by experimental and observational studies [6-9]. It should be kept in mind that the type-specific benefits of CPR may depend on patient or circumstantial factors [8]. However, it was reported by Koster et al that compression of active effectiveness of chest compression alone versus traditional CPR performed by laypersons is still not clear [10]. The long-term prognosis of chest compression alone and compression plus rescue breathing was compared in randomized clinical trials of 2500 cardiac arrest events that were realized by Florence et al [2]. The relative usefulness in survival was a few higher among those who received chest compression alone than those who received compression plus rescue breathing. These findings encourage the bystanders to provide strong chest compressions alone initially rather than compression plus rescue breathing for OHCA. All these findings emphasize the importance of training the community and their vital role on early recognition of cardiac arrest and initial chest.
compression. It is essential to warn the bystanders about providing an appropriate chest compression alone approach and its optimal long-term survival benefit [2]. The results of some randomized trials did not support the superiority of chest compression alone on compression plus rescue breathing [11,12]. A meta-analysis of these randomized trials restricted to those patients with a cardiac pathogenesis suggested a short-term survival benefit of chest compression alone [13,14]. However, the ability to apply type-specific CPR according to arrest pathogenesis imposes an artificial selection that cannot be readily achieved in the field by laypersons or by dispatchers [15]. Arrest survivors with non cardiac etiology have a poor long-term prognosis than those with underlying cardiac pathogenesis [16]. There are strong evidences that the brain recovery benefit from chest compression alone strategy with a long follow-up [17]. As it is clarified in both literatures results and experience of our case, training the community for early recognition cardiac arrest and appropriate chest compressions may increase the ratio of CPR applications for the OHCA. This training for community is not common in developing countries as us. We have just started this training. Although, the importance of untrained bystander’s Hands-Only CPR is already mentioned in AHA CPR guidelines, the spread of education is limited to developed countries.

As a result, the community and bystanders should be trained to recognize cardiac arrest early and they must be encouraged to apply appropriate chest compression for patient’s survival and better long-term prognosis.

References


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Received Date: January 13, 2016, Accepted Date: August 08, 2016, Published Date: August 18, 2016.

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