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UPDATE IN INTENSIVE CARE MEDICINE: NEWS IN RESUSCITATION

News in resuscitation. Presentation

Novedades en resucitación. Presentación

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Resuscitation is a relatively young discipline, though it has been a current topic for years, and the top impact factor publications dedicate an important percentage of their space to this field. The relevance of cardiac arrest in modern society has led to innumerable research studies in an attempt to improve the results obtained in application to this disease condition. Two events were remembered in 2010 that deserve mention: the 50th anniversary of the publication of the external cardiac massage technique by Kouwenhoven, and the 25th anniversary of the introduction in Spain of the first protocolized resuscitation training courses for healthcare professionals, through the National Cardiopulmonary Resuscitation Plan of the Spanish Society of Intensive Care Medicine (SEMICYUC). However, also in 2010, and following the conference of the International Liaison Committee on Resuscitation (ILCOR) addressing consensus on resuscitation, new international recommendations were published in this field which will strongly mark its future both in terms of training and as regards the organization of the care and even the treatment provided in such situations.[1,2]

This update reviews elaboration of the new recommendations in resuscitation and the novelties in basic life support and semiautomatic defibrillation, and in advanced life support. Finally, it presents the most relevant news in the field of training in resuscitation –a fundamental element for developing the mentioned recommendations, and for applying them to patients with cardiac arrest.

The careful examination made of the scientific evidence in developing the recommendations is an example that should be made known, and which could also be applied to other disciplines.

As regards training, there is a clear need in future to promote knowledge among all citizens of cardiac arrest, its warning signs and the importance of early activation of the emergency medical services –together with the performance of cardiopulmonary resuscitation (CPR) maneuvers until such medical care arrives. Although such instruction should include chest compression and mouth to mouth breathing maneuvers, it should be mentioned that CPR based only on chest compression does not appear to offer poorer results in terms of survival than compression with ventilation –this helping to facilitate resuscitation attempts by those people on scene at the time of cardiac arrest. On the other hand, the training of professional resuscitation teams should be oriented towards new skills - not only in reference to CPR techniques, but also to other aspects such as adequate teamwork and leadership. Lastly, it is more than likely that research effort in resuscitation will have to be oriented towards the effect of training upon patient survival in the context of cardiac arrest.[1,2]

Regarding organization of the management of cardiac arrest, three aspects must be underscored which we

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Table 1 Some differences in basic and advanced life support guidelines between the ERC and the AHA

ERC	AHA
Survival chain	
4 links (4th includes advanced life support and care after resuscitation)	5 links (4th advanced life support and 5th care after resuscitation)
Basic live support	
After confirming absence of response, establish airway access (forehead-chin maneuver) and assess breathing (see, hear, feel), before activating the Emergency Medical Service and starting chest compression (A-B-C)	After confirming absence of response, direct activation of the Emergency Medical Service and tarting of chest compression. Posterior aperture of airway access and rescue breathing (C-A-B)
Basic life support and external defibrillator algorithm similar to recommendations of 2005	New basic life support and external defibrillator algorithm, in simplified circular form, placing emphasis on quality CPR, and on confirming and immediate activation of the response system
Advanced life support	
Advanced life support algorithm similar to recommendations of 2005, placing emphasis on quality CPR and including care after resuscitation. Structure similar to ILCOR Universal Algorithm 2010	New advanced life support algorithm, in simplified circular form, placing emphasis on quality CPR, and on confirming and immediate activation of the response system
Adrenalin as vasoactive drug	Adrenalin or vasopressin as vasoactive drugs
In rhythms amenable to defibrillation, administration of vasoactive medication after third discharge	In rhythms amenable to defibrillation, administration of vasoactive medication after second discharge
Reversible causes 4 H:	Reversible causes 5 H:
Hypoxia	Hypoxia
Hypovolemia	Hypovolemia
Hypopotassemia or hyperpotassemia	Hypopotassemia or hyperpotassemia
Hypothermia	Hypothermia
	Hydrogen ion (acidosis)
Reversible causes 4 T:	Reversible causes 5 T:
Thrombosis (pulmonary / coronary)	Thrombosis (pulmonary)
Tamponade	Thrombosis (coronary)
Toxic agents	Tamponade
Tension pneumothorax	Toxic agents
	Tension pneumothorax
Special attention to hospital cardiac arrest, prevention and detection	Emphasis on hospital cardiac arrest registry
Presentation of a specific CPR algorithm in hospital	
Peri-arrest arrhythmias	
Tachycardia with pulse:	Tachycardia with pulse:
Amiodarone 300 mg, followed by 900 mg/ 24 h	Amiodarone 150 mg, followed by 1 mg/ min in 6 h
	Explicit consideration of procainamide and sotalol
	Adenosine as first choice in stable and monomorphic, broad complex tachycardia
Bradycardia with pulse:	Bradycardia with pulse:
Isoprenaline as transitory drug in poorly tolerated bradycardia and without response to atropine	Dopamine or adrenalin as transitory drug in poorly tolerated bradycardia and without response to atropine
Same consideration for rhythms with asystolia risk, even in absence of adverse signs, as in cases with poor clinical tolerance and lack of response to atropine	
Consider glucagon in case of overdose of beta-blockers or calcium antagonists	
Consider glycopyrrolate as alternative to atropine	

consider will require development in the near future. A first and salient aspect is intervention on the part of the telephone operators of the medical emergency services receiving calls alerting to possible cases of cardiac arrest. Adequate interrogation is required of the people who make such calls, adopting clear protocols to confirm the condition of cardiac arrest and at the same time to offer adequate help by telephone to allow basic CPR maneuvering. A second aspect to be considered is the development of programs for public access to defibrillation. These programs are of acknowledged efficacy, and their introduction is absolutely dependent upon adequate sensitization and awareness on

the part of the political authorities and the limitation of administrative obstacles for installing semiautomatic defibrillators in public places.[3-6] Lastly, all hospitals should adopt adequate protocols for the detection of patients at risk, for ensuring early care, and for the management of patients who have recovered from cardiac arrest. Indeed, as a more future objective, the creation of reference centers for the care of these patients could be contemplated.[7,8]

The fundamental objective in the management of cardiac arrest should be to ensure that so-called "quality CPR" is employed in all cases where resuscitation maneuvers are performed. This basically consists of adequate chest compression in terms of the force, frequency and depth applied; allowing complete chest decompression between successive compressions; avoiding hyperventilation and hyper-oxygenation; and, more relevantly, ensuring minimum interruptions during chest compression.[1,2]

Adequate and generalized training, quality CPR, and the introduction of care protocols for after cardiac arrest (including hypothermia and other measures) –with the creation even of regional centers– will all be key elements for improving survival in cardiac arrest.

The first important conference of the ILCOR for the development of single international guidelines was held in the year 2000, though following publication of these recommendations, each ILCOR member organization published its own guidelines, and the goal of establishing a single set of CPR recommendations has still not been reached. In general, consensus has been reached over the science of resuscitation, though local variations in the treatment recommendations are inevitable and are attributable to epidemiological differences, the existence of different healthcare models, differences in implementation, and cultural and economical factors. As an example, while medicalized ambulances supervised by physicians are common in Europe, in North America they are staffed by paramedics. These variations are reflected in sometimes important differences between the resuscitation guidelines of the American Heart Association (AHA) and the European Resuscitation Council (ERC) (Table 1). Undoubtedly, international cooperation has allowed more rigorous collection and analysis of the scientific evidence, though this has not always been followed by standardization of training and practice.

All those interested in Intensive Care Medicine and the care of critical patients are obliged to know and apply the latest developments in resuscitation offered by scientific evidence. The present update aims to offer the reader the most relevant aspects for facilitating knowledge and practice in this field.

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