

CARDIOPULMONARY RESUSCITATION PROTOCOLS NEW GUIDELINES AND APPROACHES

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Abstract: Introduction: Cardiopulmonary resuscitation (CPR) is fundamental to optimizing survival in acute cardiac events, playing a crucial role in responding to emergency situations. The practice of CPR has evolved and been influenced by scientific advances. The development of new CPR guidelines is a response to the pathophysiological complexities of cardiac arrests and an adaptation to the challenges in clinical practice. Objective: To analyze recent developments in CPR protocols, reviewing their implications for the clinical approach to cardiac arrests. Methodology: Integrative literature review, with a search being carried out in the Scientific Electronic Library (SCIELO) database through the LILACS and MEDLINE databases. The review covered scientific articles and guidelines, whose inclusion criteria for this research were complete articles published between 2019 and 2024 and only texts in Portuguese or English, resulting in a total of 15 articles. Results: The results revealed a number of advances in CPR protocols. Among the findings, the emphasis on the quality of chest compressions stands out. Recent protocols prioritize high-quality compressions, emphasizing adequate depth and correct frequency to maximize venous return and thus coronary perfusion during CPR. Furthermore, the study pointed to an increasing integration of real-time feedback devices during CPR, highlighting the dynamic adaptation of automatic defibrillation devices to individual patient characteristics. Conclusions: Based on the results, it is concluded that recent developments in CPR protocols are aligned with an evidence-based approach. The prioritization of compression quality and the integration of advanced technologies reflect a dynamic response to emerging demands in the clinical practice of cardiovascular emergencies. These changes reinforce the importance of constantly

updating protocols to improve survival rates and promote more positive outcomes for patients.

Keywords: Cardiopulmonary resuscitation, protocols, cardiovascular emergencies

INTRODUCTION

Cardiopulmonary resuscitation (CPR) is fundamental to optimizing survival in acute cardiac events, playing a crucial role in responding to emergency situations. The practice of CPR has evolved and been influenced by scientific advances. The development of new CPR guidelines is a response to the pathophysiological complexities of cardiac arrests and an adaptation to the challenges in clinical practice. Historically, CPR techniques have gone through several phases of improvement, reflecting a better understanding of cardiac and pulmonary physiology, as well as the mechanisms underlying heart failure. Recent research has focused on optimizing the sequence of chest compressions, ventilation, and defibrillation, seeking to maximize cerebral and cardiac perfusion during cardiac arrest. The implementation of new CPR guidelines, periodically updated by organizations such as the American Heart Association (AHA) and the European Resuscitation Council (ERC), aims to standardize resuscitation practices based on the best available evidence. These guidelines range from basic CPR, which can be performed by laypeople with adequate training, to advanced life support, which requires intervention from trained healthcare professionals.

In short, the new CPR guidelines and approaches reflect an ongoing commitment to improving the quality of emergency care and adapting to scientific discoveries. This is expected to not only increase survival, but also improve the neurological outcomes of patients who suffer cardiac arrests.

CARDIORESPIRATORY ARREST

Cardiorespiratory arrest (CPA) is a serious medical emergency, with high morbidity and mortality rates. The implementation of international protocols and algorithms has been fundamental to standardizing and organizing care for these patients. Early recognition of the triggering causes of CA and directing intervention according to each clinical scenario are crucial aspects to improve results and contribute to patients' prognosis. Furthermore, care after the return of spontaneous circulation is also essential to ensure adequate recovery and minimize sequelae. The combination of rapid and effective interventions, combined with a multidisciplinary and coordinated approach, can make a difference in the survival and quality of life of patients who experience cardiorespiratory arrest. Success is directly linked to readiness and immediate recognition, emphasizing the new understanding of cardiorespiratory arrest (CPA) as the lack of carotid pulse or the manifestation of gasping. Furthermore, it is crucial to maintain an ever-present suspicion of CRP in patients during seizure episodes. Training and practice of the cardiopulmonary resuscitation (CPR) protocol are essential to achieving restoration of spontaneous circulation. The use of simulators and complementary resources is highly effective in assimilating and retaining knowledge, highlighting the importance of periodic reviews, recommended every 1 to 2 years. However, this approach may not be sufficient; Thus, the earlier the intervention, the more favorable the outcomes.

CARDIOPULMONARY RESUSCITATION

Cardiorespiratory arrest (CPA) is a sometimes-unexpected event that represents a serious threat to life, especially for those who suffer sudden cardiac arrest (SCA) outside the hospital environment, where many patients experience ventricular fibrillation (VF). The treatment of these victims, regardless of the level of complexity of care, requires immediate CPR and defibrillation (3-5). The effectiveness of these interventions depends, in part, on the availability and functionality of resuscitation equipment, which must always be ready for use, as well as adequate team training, obtained through Basic Life Support and Advanced Life Support in Cardiology courses. (6). Performing high-quality CPR can significantly increase survival rates after a cardiac arrest, doubling or even tripling the chances of recovery.

The objective of the article is to analyze recent developments in CPR protocols, reviewing their implications for the clinical approach to cardiac arrests.

METHODOLOGY

This is a narrative review of the literature carried out from May to June 2024, through searches in the Scientific Electronic Library (SCIELO) through the LILACS and MEDLINE databases. The following descriptors were used: Cardiopulmonary Arrest; New CPR guidelines; CPR approaches. From this search, 32 articles were found, subsequently submitted to the selection criteria. The inclusion criteria were: articles in Portuguese and English published between January 2019 and June 2024 and which addressed the themes proposed for this research, studies such as literature review, meta-analysis and complete articles, available in full. The exclusion criteria were: duplicate articles, available in abstract form, which did not directly address the proposal studied

and which did not meet the other inclusion criteria. After the selection criteria, 15 articles remained that were subjected to thorough reading for data collection.

RESULTS

The results revealed a series of advances in CPR protocols. Among the findings, the emphasis on the quality of chest compressions stands out. Recent protocols prioritize high-quality compressions, emphasizing adequate depth and correct frequency to maximize venous return and thus coronary perfusion during CPR. Furthermore, the study pointed to an increasing integration of real-time feedback devices during CPR, highlighting the dynamic adaptation of automatic defibrillation devices to individual patient characteristics. CRP is characterized by the absence of effective cardiac mechanical activity and failure in ventilatory mechanics, distinguishing between in-hospital (PCRHI) and out-of-hospital (PCREH). At PCRHI, the chain of survival includes prevention and early recognition, activating the emergency medical service, performing high-quality CPR (30 compressions followed by 2 ventilations), immediate defibrillation and post-CRA care. At PCREH, after activating the emergency medical service, high-quality CPR, defibrillation with AED, advanced life support and post-CRA care are performed. Guidelines recommend performing 100 to 120 compressions per minute with a depth of 5 cm, avoiding excessive ventilation. Quantitative capnography must be used to monitor the quality of CPR. Defibrillation must follow the manufacturer's recommendations for biphasic (120 to 200 J) and monophasic (360 J) defibrillators. Medications such as epinephrine and amiodarone must be administered as directed. Advanced airway includes endotracheal intubation or advanced devices, with ventilation every 6 seconds during

continuous compressions. Additionally, the new guidelines include several important recommendations. First, early initiation of CPR by lay rescuers is emphasized as the risk of harm is low if the patient is not actually in CPR. Early administration of epinephrine is recommended for non-shockable rhythms as soon as possible, and for shockable rhythms after initial defibrillation attempts.

The use of audiovisual feedback devices during CPR is advisable for real-time optimization, and physiological parameters such as blood pressure or ETCO₂ must be used to monitor and optimize CPR. Dual sequential defibrillation is not recommended for refractory shockable rhythms. Additionally, IV access is preferable to IO for medication administration, and IO access must be considered if IV is not feasible.

For post-CA recovery, it is recommended that survivors undergo a multimodal rehabilitation assessment and receive comprehensive treatment for physiological, neurological and cognitive deficits before hospital discharge. Discharge planning must be detailed and include structured assessments for anxiety, depression, post-traumatic stress, and fatigue. Debriefing and emotional support following cardiac arrest events can benefit lay responders, EMS professionals,

and hospital healthcare workers. In the case of CA during pregnancy, priority must be given to oxygenation and airway management, continuous monitoring of the fetus and consultation with the obstetrics and neonatal teams for adequate temperature control and other specific care. These guidelines aim to improve the quality of CPR and increase survival rates after cardiac arrest, highlighting the importance of adequate training and the use of emerging technologies.

CONCLUSION

Based on the most recent evidence, it is concluded that developments in CPR protocols are clearly aligned with an evidence-based approach. The emphasis on the quality of chest compressions and the incorporation of advanced technologies demonstrate a dynamic response to emerging demands in the clinical practice of cardiovascular emergencies. These updates underscore the crucial importance of continually reviewing protocols to improve survival rates and promote more positive patient outcomes. Therefore, it is essential that healthcare professionals stay up to date with evidence-based best practices to ensure maximum effectiveness in cardiopulmonary resuscitation.

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