Review Article

Cardiopulmonary Resuscitation in Dental Practice

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Abstract

Every dental expert ought to have the vital information to recognize, differentiate, and deal with a possible dangerous circumstance. Life-threatening emergencies are unexpected clinical emergencies arising as result of, or during treatment and are fortunately uncommon but can happen to anyone. All dental practitioners require thorough knowledge and skill for the successful and safe management of these situations. This review outlines the resuscitation procedure in dental practice and emphasizes its importance in dental practice.

Keywords: Automated external defibrillator, Basic life support, Cardiopulmonary resuscitation.

Introduction

Life-threatening emergencies are unexpected clinical emergencies arising as result of, or during treatment and are fortunately uncommon but can happen to any patient, dentist, attendant, receptionist, or any staff member.[1,2] The incidence of such situations is not insignificant which emphasize the fact that dentist and specialists in various domains of dental medicine must have appropriate skills, training as well as the proper equipment to deal with potentially life-threatening conditions.[3] In this era, the incidence of such incidents has risen due to increased number of geriatrics seeking dental care, increased individuals with systemic conditions (hypertension, diabetes, cardiac disease, etc.), therapeutic advances in the dental field, longer dental appointments, and more use and administration of medicines in dentistry.[4,5]

The diagnosis and management of medical emergencies represent a current issue for dental prevalence of preoperative fear and anxiety among patients receiving dental care. In a long-term study, it was observed that stress and acute pain were the most common emergency seen which occurred when the patient was undergoing treatment.[6]

Available evidence suggests that many dentists lack knowledge of basic life support (BLS) and feel incompetent and insecure in managing medical emergencies due to less training in this aspect. With this in mind, various national and international bodies such as American Heart Association (AHA) and International Trauma Center have formulated certified courses BLS, Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support, etc., for healthcare professionals and paramedical staff which use latest e-simulation technology and conduct hands on sessions to enable the candidates to treat patients in virtual health care setting. A team approach along with sound theoretical and practical training in effective expired air resuscitation, cardiopulmonary resuscitation, oxygen administration, and availability and use of the emergency drugs can help in controlling the emergency situations. This review outlines the resuscitation procedure in dental practice.

The key elements in providing BLS to a patient who suddenly becomes unresponsive on the dental chair are recognition of signs of cardiac arrest, heart attack, stroke, and foreign-body airway obstruction followed by resuscitation and defibrillation.[7] In the initial phase of cardiac arrest, occasional, irregular, and slow gasps along with a snoring sound are heard that originates from the brain stem that is still functional despite being deprived of oxygen. This needs to be promptly assessed by the clinician so as to improve the survival rate of the patient.[8] Furthermore, the clinician should be aware that the first manifestation in cardiac arrest may be generalized seizures. Once the patient is unresponsive and shows signs of no breathing or just wheezing with absence of heartbeat that the

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emergency response system must be initiated. If the pulse is not felt within 10 s, the chest compressions should be started.[7,8] Chest compressions can also be performed by unprepared bystanders under proper guidance. For proper positioning of the hands for compressions, the patient should be placed on leveled surface with the face up and apparel covering the chest should be loosened. The clinician is to be seated beside the patient with the impact point on one hand on lower half of the breastbone and the other hand being placed on top of it. The arms are straightened with shoulders straightforwardly above the hands. The compressions are delivered at a depth of at least 5 cm and pace of 100–120 compressions/minute. These compressions directly compress the heart, increase the intrathoracic pressure, and generate the oxygen and blood flow to the brain and heart. For the circulation to be revived, the rate of these compressions is important.[7-9]

The compression to ventilation ratio is 30:2. In clinics, once the ventilation devices such as pocket mask or bag/valve arrive, two breaths are given after a set of 30 compressions. The E-C brace technique is utilized, wherein the thumb and forefinger of one hand are used to make the letter C and the three fingers structure a E to lift the points of the jaw. The other hand is used to convey the breath and chest rise is observed. This is carried out until the breathing is normalized or the automated external defibrillator (AED) becomes available. AED is a lightweight, compact, and simple device that analyzes the patient's rhythm and suggests the use of defibrillator in presence of ventricular tachycardia or absence of pulse. The AED is used only if the victim does not respond, is not breathing, and is pulseless. AED is now a mandatory equipment and is made available at all public places also.[7,9]

Once the AED arrives, the case is opened, and the power is switched on. The electrode paddles are attached on the patient's chest by following the position graphs on the cushion. The instructions by the AED are followed and while the device is analyzing the rhythm, no one should touch the patient. If shock is indicated, the shock button is pushed and the cardiopulmonary resuscitation (CPR) is commenced. If no shock is advised, CPR is resumed. This is done until the patient starts to breath normally and the patient has recovered. However, if the single rescuer gets exhausted and the patient is still unresponsive further medical assistance is summoned[9,10] (Figure 1).

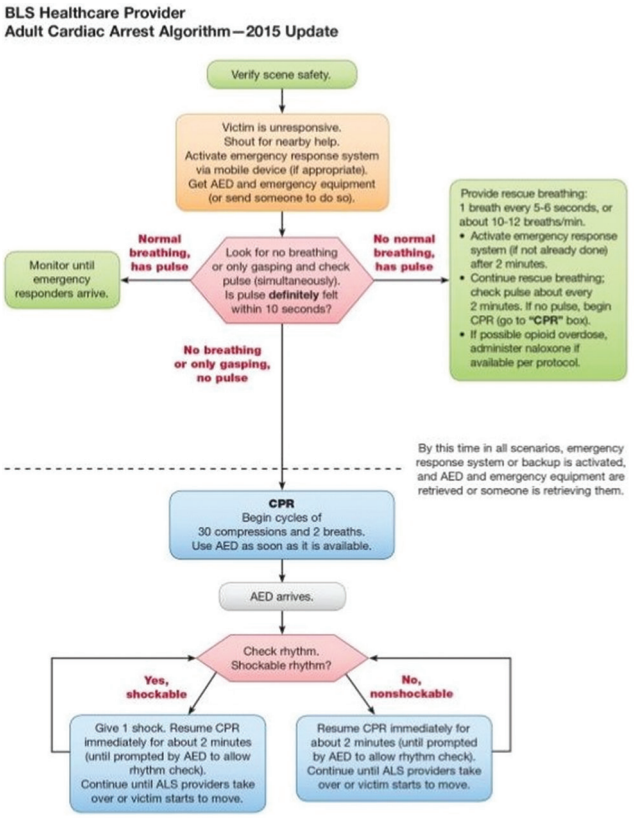

Figure 1: Adult cardiac arrest algorithm

Discussion

As dentists, the moral role is to provide professional first aid for ethical and legal reasons; hence, BLS becomes a mandatory requirement.[11] If dentists have minimal knowledge about these emergency situations, it results in dissatisfaction, incompetence, and a state of guilt toward their responsibility.[12] According to the current guidelines of statutory bodies across the globe, dental professionals should be capable to perform BLS and be acquainted with defibrillation techniques. Furthermore, the AHA suggests courses on ACLS for dentists.[13]

A study on Saudi students by Al-Shamiri *et al*.[14] concluded that poor knowledge among dental students regarding BLS and showed the urgent need for continuous refreshing courses for this critical topic. Atherton *et al*.,[15] in a study, perceived a need for practice drills and training for better management of medical emergencies. Gupta *et al*.[16] stated in their study that less than half (42.1%) of the dentists reported having received practical training in management of medical emergencies during their undergraduate and postgraduate education. Chandrasekaran *et al*. carried out a study to evaluate awareness of BLS among medical, dental, nursing students, and doctors and concluded that their knowledge was very poor and needed to be improved.

For better handling of emergency situations various Continuing Dental Education, workshops, lectures, and course modules with simulation laboratory for BLS and mock drills need to be incorporated in the dental curriculum that will enable the professionals to manage the medical emergencies readily.

Conclusion

BLS or CPR is the most important aspect in managing cardiac emergencies and should be performed effectively and promptly with minimum interruptions until the emergency medical help arrives. The AHA keeps refining its guidelines for making BLS more effective and, hence, recommends the health care professionals to undergo BLS training on annual basis. Medical

emergencies irrespective of their cause must be diagnosed quickly and managed effectively to increase the chances of patient survival.

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