Defibrillator: A lifesaving tool in emergency cardiac care.

Preeti Touma*

Department of Cardiovascular Medicine, Wayne State University, Michigan

Introduction

The human heart, with its rhythmic beat, is an extraordinary organ that sustains life by continuously pumping oxygen-rich blood throughout the body. This intricate system operates flawlessly in most cases, but sometimes, unforeseen circumstances can disrupt its harmonious rhythm, leading to a life-threatening condition known as cardiac arrest. During these critical moments, immediate and effective medical intervention is essential, and that's precisely where defibrillators emerge as lifesaving heroes. A defibrillator is a medical device designed to deliver an electric shock to the heart, with the primary aim of restoring a normal rhythm and, in many cases, saving lives. In this article, we delve into the significance of defibrillators in emergency cardiac care, their mechanisms of action, and their widespread availability across various settings. To grasp the importance of defibrillators, it is vital to comprehend how they work. Cardiac arrest occurs when the heart's electrical system malfunctions, leading to chaotic and uncoordinated contractions of the heart muscle. This quivering, medically termed ventricular fibrillation or ventricular tachycardia, inhibits the heart from effectively pumping blood to vital organs, causing oxygen deprivation and endangering the person's life [1].

A defibrillator operates on the principle of controlled electric shocks to the heart. The device is equipped with pads or electrodes that are placed on the patient's chest. When activated, the defibrillator releases an electric current through these electrodes, briefly stopping the chaotic electrical activity in the heart. This momentary interruption provides an opportunity for the heart's natural pacemaker to take over and restore a regular, coordinated rhythm, facilitating proper blood circulation. Promptness in administering defibrillation is paramount, as the chances of survival decrease rapidly with every passing minute after cardiac arrest occurs. For every minute that defibrillation is delayed, the odds of survival decline by approximately 10%. Quick access to defibrillation is critical in maximizing the chances of successful resuscitation and minimizing potential long-term complications [2].

Recognizing the pivotal role of defibrillators in saving lives, there has been a concerted effort to make these devices widely available across various settings. Hospitals, being the primary healthcare centers, are equipped with advanced defibrillators, ensuring timely intervention in cardiac emergencies. Ambulances are also equipped with defibrillators, allowing paramedics to begin the resuscitation process even before reaching the hospital. However, one of the most significant strides in enhancing accessibility to defibrillators is the widespread deployment of Automated External Defibrillators (AEDs) in public spaces. These user-friendly devices are strategically placed in places like shopping malls, airports, gyms, schools, and other crowded areas, where cardiac arrests may occur. AEDs are designed to be operated by laypeople with minimal training, as the device provides clear voice and visual instructions to guide the user through the defibrillation process [3,4].

Cardiac arrest remains a leading cause of death globally, claiming millions of lives each year. However, defibrillation has emerged as a powerful tool in improving survival rates. Immediate defibrillation, when combined with early CPR, can increase the chances of survival by more than 50%.The success of defibrillation in cardiac arrest largely depends on the "Chain of Survival" concept, which emphasizes the importance of a coordinated response in emergency situations. The four key links in this chain are early recognition and activation of emergency services, early CPR, early defibrillation, and timely advanced medical care. While AEDs are designed for ease of use, it is still essential for individuals to be familiar with their operation. Basic CPR and AED training are widely available and are often provided to school staff, workplace employees, and members of the community. Empowering individuals with the knowledge and confidence to use defibrillators can significantly improve response times during cardiac emergencies and positively impact patient outcomes [5].

Conclusion

Defibrillators represent a remarkable advancement in medical technology, embodying hope and saving lives during moments of crisis. Their ability to rapidly restore a regular heartbeat has revolutionized emergency cardiac care, offering a chance at survival for countless individuals experiencing cardiac arrest. The extensive availability of defibrillators in public spaces and the emphasis on training laypeople in their use have transformed bystanders into potential rescuers, bridging the gap between the occurrence of cardiac arrest and professional medical assistance .As a society, we must continue to prioritize the dissemination of knowledge and training on defibrillators and CPR. Empowering more individuals with these life-saving skills will undoubtedly pave the way for a

***Correspondence to:** Preeti Touma, Department of Cardiovascular Medicine, Wayne State University, Michigan, E-mail: Preeti.touma@va.gov

***Received:** 27-Jul-2023, Manuscript No. AAACTS-23-109241; **Editor assigned**: 31-Jul-2023, PreQC No. AAACTS-23-109241(PQ); **Reviewed**: 14-Aug-2023, QC No. AAACTS-23-109241; **Revised:** 21-Aug-2023, Manuscript No. AAACTS-23-109241(R); **Published:** 28-Aug-2023, DOI: 10.35841/aaacts-6.4.157*

***Citation:** Touma P. Defibrillator: A lifesaving tool in emergency cardiac care. Ann Thorac Cardiovasc Surg 2023;6(4):157*

more heart-safe environment, where cardiac emergencies are met with prompt and effective responses, ultimately saving lives and preserving the precious gift of life bestowed by our remarkable human hearts.

References

1. Li L, Jin Q, Huang J, et al. Intramural foci during long duration fibrillation in the pig ventricle. Circ Res. 2008;102:1256–64.
2. Tabereaux PB, Dosdall DJ, Ideker RE, et al. Mechanisms of VF maintenance: Wandering wavelets, mother rotors, or foci. Heart Rhythm. 2009;6:405–15.
3. Dosdall DJ. Intracardiac atrial defibrillation. Heart Rhythm. 2007;4(3 Suppl):S51–6.
4. Wikswo JP, Jr, Lin SF, Abbas RA, et al. Virtual electrodes in cardiac tissue: A common mechanism for anodal and cathodal stimulation. Biophys J. 1995;69:2195–210.
5. Ranjan R. Mechanism of anode break stimulation in the heart. Biophys J. 1998;74:1850–63.

Citation: *Touma P. Defibrillator: A lifesaving tool in emergency cardiac care. Ann Thorac Cardiovasc Surg 2023;6(4):157*