



Maternal Cardiac Arrest: An Emerging Threat

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Abstract

CPR occurs during pregnancies is a reality. When this happens, it's the most critical situation for the caregivers to manage immediately. A thorough understanding of changes that occur during pregnancy can help in making correct decisions. Although the attention should be on the mother, it is important to remember that another possible life is on the line. The mother is resuscitated in the same way as any other patient, with a few slight adaptations due to the changes that occur during pregnancy. The multidisciplinary team should be involved early in the process to ensure that both the mother and the newborn receive proper care. This article will analyze the risks and concerns during this emergency.

Keywords: CPR; Maternal Cardiac Arrest; Pregnancy; Emerging Threat; Resuscitation

Abbreviations

CPR: Cardiopulmonary Resuscitation; AED: Automated External Resuscitation; AHA: American Heart Association; ECC: Emergency Cardiovascular Care

Introduction

CPR is a medical milestone, but sometimes it is in vain. The term "CPR" was originally coined less than 50 years ago. The roots of resuscitation, however, are centuries old. This leads to a slowly evolving course hampered by the rejection of inadequate techniques, the curiously slow adoption of proven interventions, and even cycles of abandonment and rediscovery [1]. To understand and follow the evolution of modern practices, one must first examine the history of resuscitation.

A cardiac arrest is a condition in which the heart no longer beats normally. Because of this, the brain and other vital organs cannot receive oxygen-rich blood. Unless treated immediately, a person in cardiac arrest is clinically dead and will remain that way. A high-quality CPR can artificially keep the blood pumping, but an AED is necessary to restart the heart. An AED can help a person whose heart has stopped beating by delivering a defibrillation "shock". An AED defibrillator can significantly increase a person's chances of survival by 7-10% every minute that he/she remains in sudden cardiac arrest without a shock [1,2].

Oxygen deprivation caused by cardiac arrest is particularly harmful to pregnant women. As the fetus grows, the mother must provide the fetus with significant amounts of oxygen. A woman's oxygen consumption increases by 20% and her cardiovascular metabolic rate increases by 40% when she is

pregnant. Pregnancy-related fluctuations in hormones such as progesterone and estrogen can also restrict airways and increase the chances of maternal cardiac arrest. When they are combined, these physiological changes make cardiac arrest a particularly life-threatening condition in pregnant women [1,2]. It is therefore critically important to start CPR immediately and administer an AED to pregnant women suffering from sudden cardiac arrest.

Risks in pregnancy

Although the causes of cardiac arrest are well-known in general, the causes in pregnancy are less well-known, however, an earlier study has discovered that a dysfunctional heart's conduction system could be one of the causes. There are also women on the list who already have a bunch of heart disease risk factors. Aside from that, lifestyle illnesses such as diabetes, hypertension, and hyperlipidemia enhance the risk, and obesity is one of the variables that we cannot avoid. Preeclampsia and gestational diabetes, on the other hand, require special monitoring because they both pose a high health risk [3].

Expectant mothers are at risk for cardiac arrest for a variety of reasons, but the causes can be classified as obstetric, non-obstetric, or iatrogenic. A hemorrhage, eclampsia, and an embolism of amniotic fluid are all obstetric causes. Sepsis, pulmonary embolism, previous cardiovascular disease, and stroke are some of the most common non-obstetric causes. Anesthetic problems during delivery or testing are common iatrogenic causes. In the event of maternal cardiac arrest, particular guidelines should be followed due to the hazards connected with anesthetics. Intubation for anesthetic care, in particular, can obstruct prompt CPR and resuscitation in pregnant women who experience cardiac arrest. As a result, CPR must take precedence over intubation [4].

Concerns in the emergency

The updated AHA CPR and ECC recommendations, which were announced in 2020, provide a framework for optimizing resuscitation for in-hospital maternal cardiac arrest sufferers [5]. The recommendations, developed by top physicians and scientists, use existing knowledge to establish a maternal resuscitation algorithm that emphasizes the significance of simultaneous intervention. Concurrent intervention, in general, means that advanced life support personnel responding to a maternal cardiac arrest must conduct both maternal and obstetric treatments at the

same time which highlights the need for a multidisciplinary expert team to function during these emergencies [7].

Because of the pressure of the uterus which inhibits the effectiveness of compressions to circulate blood, chest compressions will not be successful without left lateral uterine displacement. Similarly, while doing chest compressions, defibrillation, and other critical resuscitation procedures, appropriate personnel should concurrently be preparing for and, if necessary, performing a perimortem cesarean delivery.

Points to keep in mind

- Whenever cardiac arrest is identified, provide high-quality CPR along with the defibrillation as per the indication.
- While calling the EMS never forget to tell that the patient is pregnant so that the team can arrange a multidisciplinary expert who can perform an emergency Perimortem C-section as soon as possible.
- The maternal cardiac arrest team should rule out pregnancy-related outcomes. Always find out the causes before any actions [6].
- Remember shock from the defibrillator as well as the pressure from the chest compressions will not harm the fetus.
- Recall that two persons need help when a pregnant mother is in cardiac arrest. Perform airway management, and intubation only with an expert as this part is very difficult. Priority should be given to preventing hypoxia by prompt oxygenation and airway management with a goal of 100% oxygen delivery. Be vigilant to avoid excess ventilation.
- While giving shocks we should detach the fetal monitors as it will interact with the result and always provide continuous lateral uterine displacement.
- If there is no return of spontaneous circulation immediate baby mortem cesarean delivery should be performed.
- Fetal monitoring should not be prioritized as it interferes with resuscitation. But fetal monitoring should be done in those cases where the mother is comatose and receiving targeted temperature management [6].

Conclusion

Cardiac arrest during pregnancy is very difficult to manage as it cost two lives. This review has included the most important

concerned area to concentrate on during the care which helps for the survival of both mother and child. There are concerning areas which we should concentrate on in this regard. Prompt action by the multidisciplinary team aid's good chance of survival of both mother and child.

Conflict of Interest

All authors declared no conflicts of interest.

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