

A Review on Cardiogenic Shock and Various Approaches for the Treatment

Srividya Balarammahanty*

Department of Pharmaceutical Analysis, Yalamarthy Pharmacy College, Andhra University,
Vishakapatnam, India

Research Article

Received: 02/02/2017
Accepted: 23/02/2017
Published: 30/02/2017

*For Correspondence

Srividya Balarammahanty,
Department of Pharmaceutical
Analysis, Yalamarthy Pharmacy
College, Andhra University,
Vishakapatnam, India, Tel:
7207494335.

Keywords: Cardiogenic shock,
Myocardial infarction, Heart
attack

E-mail: vidyacps@gmail.com

ABSTRACT

Cardiogenic shock (CS) is a state of critical end-organ hypoperfusion which occurs due to reduced cardiac output. Right ventricular dysfunction is the major cause for CS. Cardiogenic shock is the major cause of death in acute myocardial infarction which mainly happens due the consequence of acute left ventricular failure. Cardiogenic shock occurs in the patients who are hospitalized with acute myocardial infarction with ST elevation. This is associated with Persistent hypotension, severe reduction in cardiac index and elevated filling pressure. This review discusses the major causes of the CS and different approaches for treatment.

INTRODUCTION

Cardiogenic shock occurs in 5% to 8% of patients hospitalized with ST-elevation [myocardial infarction](#). An occurrence of subsequent ventricular dysfunction after the acute [myocardial infarction](#) is the common cause of cardiogenic shock which happens in the majority of cases (about 80%). The other causes are mitral regurgitation, ventricular wall rupture or septal rupture, these causes less frequent [1-8].

CS is also explained as a state with the systolic blood pressure of less than 90 mmHg for at least 30 minutes. The clinical signs associated with this are of hypo perfusion, which include decreased urine output, peripheral vasoconstriction and a change in the mental status [9-15]. There is clear information about the heart disorders in many open Access and peer reviewed Journal. [Open access journals](#) are the Journals which are available without any legal or financial or technical barriers to the readers [16-19]. These Journals has more visibility and accessibility which helps the scientists and professional worldwide to gain the knowledge and information. [Peer reviewed journals](#) publish the high quality articles after it has been subjected to multiple reviews by scholars or scientists who are experts in that particular field [19-25].

Majority of patients develop shock after reaching to the hospital which focuses an important fact that medical contact may have been done before development of shock and which shows a possible way for prevention. It develops in 10% to 20% of patients with AMI (Hospitalized). Mortality of such patients are 80% or higher. Very few patients develop shock immediately after AMI. About half of patients develop shock within 24 hours [25-30].

The professional [societies](#) are primarily educational and informational which meant for enhancement of technology and science [35-39]. Their impact flows from their continuing and highly visible functions, to develop professional excellence, to publish professional journals, to raise public awareness, and to make awards. Through their work, they help to define and set standards for their professional fields and to promote high standards of quality through awards and other forms of recognition [40-45]. The major society like [National Heart Forum of UK](#) is an organisation in the UK which mainly working to reduce the risk of non-communicable diseases and bring awareness among the people about the [heart diseases](#). [European Society of Cardiology](#) is another Society which mainly organizes many scientific meetings and programs which is mainly aimed for professionals of cardiology which brings awareness for the treatment and care of Heart disease [45-49]. It promotes the educational activities relating to the prevention and treatment of cardiovascular disease and also helps in the development of knowledge regarding cardiovascular health and practice [50-56]. [Mongolian society for Pediatric cardiology](#) is the society which focuses on the wide range of topics Myocardial Infraction, Heart failure, Congenital Heart Disease, [Cardiomyopathy](#), and Rheumatic Heart Disease [57-59]. [Nigerian Cardiac Society](#) of South Africa is associated with Omics thereby endorsing the scientific events conducted in the field of Cardiology [60-62].

[Journal of Clinical & Experimental Cardiology](#) is an open access Journal which explores the concepts related to Heart Diseases related to Heart, Cause of Heart Failure, Cardiac Surgery, Sudden Cardiac arrest, Heart Transplants [63-65]. [Cardiovascular Pharmacology Journal](#) is an open access Journal which mainly discusses the various therapeutical approaches for cardiovascular diseases, Cardiovascular Drugs, Cardiovascular Safety Pharmacology, Cardiac Arrest [66-68]. [International Journal of Cardiovascular Research](#) is a hybrid open access which explores the topics on [Heart Failure](#), [Cardiomyopathy](#), Cardiac Transplantation, Heart Diseases [69-73]. [The 2nd International Conference on Cardiovascular Medicine and Cardiac Surgery](#) which is going to be held on March 15-16, 2017 in London, UK explores the possibilities towards better Cardiac Health [74-80].

CAUSES OF CARIOGENIC SHOCK

It occurs if when the heart suddenly has been affected so much that it is unable to supply the blood rich in oxygen to the body [81-83]. The major cause is Systolic dysfunction of the heart. The most common cause of CS is damage to heart muscle by [heart attack](#). This damage effects the pumping chamber of the heart prevent the left ventricle from work well as a results the heart can't pump enough blood to the rest of the body. If the flow of the blood to the organs is not restored quickly then it may leads to death [84-88].

TREATMENT OF CARIOGENIC SHOCK

Medicines

It can be treated by depending upon cause. Therapeutically it can achieved by Increasing the force with which the heart muscle contracts, by preventing blood clots from forming, by Treat a heart attack [89,90].

- Inotropic agent: These are precursors of Precursors of norepinephrine and epinephrine. BP is increased primarily due to inotropic effect. E.g. dopamine, dobutamine, milrinone, amrinone [91-93]
- Vasopressors: These are beta adrenergic agonist. BP can be increased successfully in patients with hypotension with dopamine. Epinephrine increases oxygen delivery and oxygen consumption and increase systemic and regional lactate concentration. E.g. norepinephrine ,epinephrine, dopamine [94-98]
- Antithrombotic therapy with aspirin and heparin should be given as routinely recommended for MI [99].

Medical Devices

Medical devices can help the heart pump and improve blood flow. Devices used to treat cardiogenic shock may include: An intra-aortic balloon pump (IABP): For a long time the mainstay of mechanical therapy for CS is Intra-aortic balloon counter pulsation. The aorta is the main blood vessel that carries blood from the heart to the body.

This device is placed in the aorta [100-105]. The inflation and deflation of the balloon at the tip of the device is in a rhythm which matches the heart's pumping rhythm which improves coronary and peripheral perfusion. Accurate timing of inflation and deflation provides optimal support. IABP is an established therapeutic means in patients undergoing cardiogenic shock refractory to medical therapy and is discussed in the article entitled [Intra-aortic Balloon Pump Entrapment in a Transfemoral Sheath: Successful Management with Retrograde Transradial Wiring and Externalization written by Giuseppe Biondi Zoccai from Italy](#) [106-110].

This helps the weakened heart muscle to pump as much blood as it can, which helps in supplying the more blood to vital organs, such as the brain and kidneys [111-114].

A left ventricular assist device (LVAD): This device is used when the left ventricle is damaged due to the shock which is the major pumping chamber of the heart. This is a device is a battery-operated pump. An LVAD helps to pump the blood from heart to the body [115-120].

Medical Procedures

Medical procedures and surgery can repair heart damage and can restore blood flow to the heart and the rest of the parts of the body and help keep a patient alive while he or she recovers from shock [121-123].

Percutaneous coronary intervention (PCI): PCI, also known as coronary angioplasty, is a procedure used to open blocked coronary arteries and treat an ongoing heart attack. A stent is placed in a coronary artery during PCI which helps to keep the arteries wide open [123-128]. A stent is a small mesh tube. An case report entitled "[Rescue PCI Immediately after Failed Primary CABG in Patient with Cardiogenic Shock](#)" by Mohammed Habib has discussed about a case treated with PCI in Cardiogenic shock [129-131].

Medical Surgery

a) Coronary artery bypass grafting: This is a surgery in which surgery, arteries or veins from other body parts are used to bypass blocked or narrowed coronary arteries. This creates a new passage for blood to reach the heart [177].

b) Heart transplant. This surgery is rarely is done only in an emergency situation like cardiogenic shock. It should be done very carefully [132-136]. Doctors need to be very careful, make sure a patient will get benefit from a [heart transplant](#) and to find a matching heart from a donor. Doctors may recommend a transplant if they feel that the patient's chances of long-term survival will be improved [137-142].

An article entitled "[Survival Undergoing Rescue Percutaneous Coronary Intervention under the Support of Intra-aortic Balloon Counter-Pulsation in Acute Myocardial Infarction Complicated by Cardiogenic Shock](#)" by Zhao-Feng Li explains a novel approach for the treatment of cardiogenic shock after AMI [143-147]. Novel use of minimally invasive circulatory support in a conference abstract entitled "[Circulatory support in cardiogenic shock](#)" by George P Batsides [148-150].

CONCLUSION

CS is a disorder which can be treated with a reasonable chance for full recovery. It is important to recognize that although patients with CS are at very high risk for early death, great potential exists for salvage. The different approaches for the treatment have been discussed; still novel approaches should be invented for the treatment with minimal undesired affects. The novel therapies may help in decreasing the significant mortality of cardiogenic shock in the future.

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