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Cardiogenic Shock

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Cardiogenic Shock

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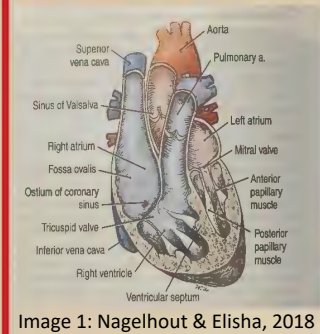


Image 1: Nagelhout & Elisha, 2018

What is cardiogenic shock (CS)?

- End organ hypoperfusion related to a significant decrease in cardiac output due to a primary cardiac diagnosis (Mebazaa et al., 2018)

Why cardiogenic shock?

- HIGH INCIDENCE OF MORTALITY
- Approximately 100,000 cases per year with 30-day mortality approaching 50% (Brenner et al., 2020)

Pathophysiology

- All types of shock indicate a state of multiorgan dysfunction, the only difference in shock state is the initial insult that caused this shock state to occur

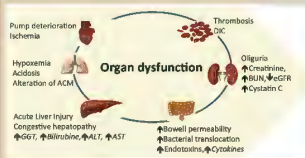


Image 2: Chioncel et al., 2020

- CS occurs due to a primary cardiac insult leading to a disruption in oxygen supply
- CS leads to end-organ failure because the tissues are deprived of oxygen because the cardiac pump is no longer functioning properly to deliver oxygen
- Etiologies: myocardial infarction, ventricular dysfunction, or valve failure

Signs and Symptoms

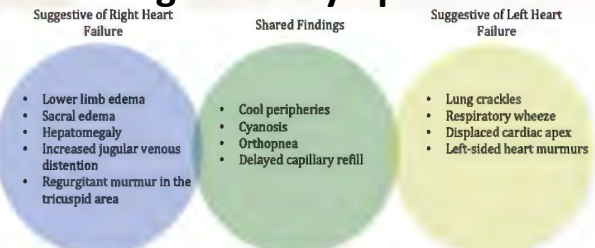


Figure 1: Vahdatpour et al., 2019

Significance of Pathophysiology

- The primary cause is acute myocardial infarction causing a downward spiral
- It is imperative to identify cardiogenic shock and intervene early to prevent end-organ failure

Clinical Classifications

Pre-CS:

- Identification early
- Hypoperfusion and SBP > 90mmHg without circulatory support (Chioncel et al., 2020)

CS:

- Hypoperfusion and SBP <90 for >30min or the need for pharmacologic or IABP (Intra-Aortic Balloon Pump) to maintain SBP or MAP (Chioncel et al., 2020)

Refractory CS:

- Ongoing tissue hypoperfusion despite 2 vasopressor medications and treatment of initial etiology (Chioncel et al., 2020)

Nursing Implications

- Providing nursing education regarding signs and symptoms, pathophysiology and management options will allow early intervention and help to decrease the mortality rate
- Critical care nurses are with the patients the majority of the time and is their responsibility to notify the physician with changes in patient status

Critical Management

- Treatment options always focus on the reversal of the underlying cause whether it be valvular dysfunction, acute myocardial infarction, ventricular failure, or cardiac arrest

Pharmacological Treatment

- Fluid volume resuscitation should be considered if not contraindicated and requires monitoring of cardiac output as a state of hypervolemia could cause worsening cardiogenic shock (Chioncel et al., 2020)
- Persistent low cardiac output and hypotension may require vasopressors and inotropes. 80-90% of CS patients receive pharmacological support (Chioncel et al., 2020)
- Vasoactive medications should be limited to short term use as they increase myocardial oxygen consumption and are complicated by lethal arrhythmias (Chioncel et al., 2020)

Mechanical Circulatory Support Devices

Impella



Image 3: Abiomed, 2021

- The Impella device is inserted into the left ventricle and supports left ventricular output with the use of a motor that unloads the left ventricle increasing cardiac output and end organ perfusion (Abiomed, 2021)

Intra-Aortic Balloon Pump (IABP)

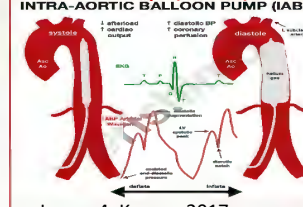


Image 4: Kumar, 2017

- Produces a significant decreased afterload and increased coronary artery perfusion
- Increases cardiac output while decreasing workload on the heart
- Mechanical cardiac devices are utilized short term until surgical intervention or reversal of the initial cause can be reversed

Conclusion

- Cardiogenic shock continues to have a high mortality rate
- Prompt identification of the underlying cause is imperative for the selection of treatment
- Management includes pharmacological and mechanical support
- Future research should focus on a standard of care to treat cardiogenic shock as it encompasses numerous etiologies

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