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2022 Symposium Presentation

Surviving Sepsis Campaign: Strategies to Implement in Cardiogenic Shock Management

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Abstract

The Surviving Sepsis Guidelines can serve as a structure to help educate and create a set of recommendations on how to care for patients through this complicated pathway of shock. Designing a cardiogenic shock bundle could reduce the variability of care and possibly improve survival. Also, a more standard protocol would allow a review of the outcomes and a system to change practice nationally when new data or technology becomes available. This could create a continuous quality improvement cycle. Creating a “Surviving Cardiogenic Shock” system could help provide awareness for recognition of cardiogenic shock and advanced management alternatives needed at level one and two hospitals. The creation of cardiogenic shock systems of care would support smaller hospitals with a Hub and Spoke structure. Cardiogenic shock is not septic shock, but those in cardiology and cardiac critical care can and should take lessons from the Surviving Sepsis Campaign.

Keywords: Surviving Sepsis Campaign, cardiogenic shock, management

Background

The Surviving Sepsis Campaign is an international set of guidelines for the management of sepsis and septic shock. It provides guidance on the care of hospitalized adult patients with, or at risk of, sepsis. The goals are early identification and appropriate management in the initial hours after the development of sepsis to improve outcomes. To achieve that goal, *sepsis bundles* are used to improve program performance by integrating sepsis scoring, education, metrics, and patient outcomes. Meta-analysis and clinical trials have shown that using sepsis bundles improves mortality rates for patients with sepsis and septic shock. All bundles use sepsis screening tools, and the debate continues about which one is best for each situation. The most common include the quick sequential organ failure assessment (qSOFA), modified sequential organ failure assessment (mSOFA), national early warning score (NEWS), and modified early warning score (MEWS). Indeed,

the EPIC electronic health record system has the MEWS already built in.

Recommendations

First published in 2004,¹ the guidelines put forth by the Surviving Sepsis Campaign have had several revisions, with the most recent being at the end of 2021.² Most recently, over 20 recommendations have been updated. One recommendation supports the use of the SOFA score over MEWS or NEWS. Another recommendation is to give crystalloid (30 mL/kg) to patients with hypoperfusion or shock within 3 hours. There is also a recommendation to use dynamic measures to guide fluid resuscitation over physical examination or static parameters. A suggestion for this is to use capillary refill as a guide for resuscitation. However, the new guidelines do not emphasize measuring central venous pressure; they do recommend looking at volume loading

through some of those techniques. A mean arterial pressure of 65 mmHg is the recommended target pressure. The reality, though, is that there are not a lot of hemodynamic parameters included in the recommended sepsis bundle.

Cardiogenic Shock vs Septic Shock

While cardiogenic shock is not septic shock, the guidelines for septic shock do inform care. Sepsis has a relatively common etiology, including infection or inflammation. It has low-tech initial therapies that include intravenous (IV) fluids, IV antibiotics, IV vasopressors, and basic hemodynamic monitoring such as heart rate, blood pressure, and electrocardiogram. All therapies are available in acute care hospitals. Alternatively, cardiogenic shock has various etiologies and phenotypes that make the initial therapy variable as well. Treatment of cardiogenic shock involves advanced therapies that are not cheap and are not available in all hospitals.

The goal of the septic bundles is to cut down on variations, which is helpful for escalation and de-escalation. Thus, can a bundle be adapted to help inform cardiogenic shock therapy and reduce the huge variability in practice?

Critical Care Cardiology Trials

Clinical registries, such as the Critical Care Cardiology Trials Network (CCCTN), have looked at variations in care in the management of cardiogenic shock. This includes the use of pulmonary artery (PA) catheters to assess and guide management, acute mechanical circulatory support devices such as the intra-aortic balloon pump (IABP), and the Impella percutaneous ventricular assist device (pVAD) (Abiomed).

Utilization of the IABP in all care centers, tertiary or quaternary, varied and was dependent upon whether a shock team was present or not.^{3,4} The presence of a shock team correlated with less IABP use and more Impella implantations. One of the key issues is that only 42% of patients who had advanced circulatory support and Impella or extracorporeal membrane oxygenation (ECMO) had a PA catheter placed. In the CCCTN registry, the use of a PA catheter was associated with improved survival. However, the use of PA catheters varied significantly among the different centers. This may be in part due to the perceived risk associated with use and cost. Surprisingly, many of the patients who received advanced mechanical circulatory support did not have PA catheter monitoring. While there are currently no randomized clinical trials demonstrating that PA catheters improve outcomes in conjunction with AMCS, current registries such as the CCCTN and the National Cardiogenic Shock registries demonstrate a strong correlation with survival in cardiogenic shock when a PA catheter is utilized to guide care. While there is literature on protocols for the management of cardiogenic shock and shock teams, there currently is no national consensus, similar to the Surviving Sepsis Bundles. It is likely

that a consensus of best practice guidelines for the management of cardiogenic shock or care bundles may allow for a structure to further improve outcomes.

Conclusion

The Surviving Sepsis Guidelines can serve as a structure to help educate and create a set of recommendations on how to care for patients through this complicated pathway of shock. Designing a cardiogenic shock bundle could reduce the variability of care and possibly improve survival. Also, a more standard protocol would allow a review of the outcomes and a system to change practice nationally when new data or new technology becomes available. This could create a continuous quality improvement cycle. Creating a “Surviving Cardiogenic Shock” system could help provide awareness for recognition of cardiogenic shock and advanced management alternatives needed at level one and two hospitals. The creation of cardiogenic shock systems of care would support smaller hospitals with a Hub and Spoke structure. Cardiogenic shock is not septic shock, but those in cardiology and cardiac critical care can and should take lessons from the Surviving Sepsis Campaign.

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