

Pathophysiology, assessment, and management of sepsis

In 2020 the World Health Organization (WHO) released a study approximating 11 million annual deaths and millions more incapacitations as a result of sepsis. Most of these fatalities are reported to be children and members of middle to lower income populations because of their higher susceptibility and potential lack of access to appropriate treatment. ([link](#))

Sepsis is a severe or even life-threatening complication of infection in which inflammation and hypercoagulation occurs throughout the body in an attempt to battle said infection. The natural inflammatory response to infection is the release of cytokines which are small proteins critical in the process of cell signaling. Different cytokines have both pro-inflammatory and anti-inflammatory functions. ([link](#)) The excessive release of cytokines can not only cause microvascular thrombosis and cytokine storm, but also may cause systemic inflammatory response syndrome (SIRS). Other causes of SIRS include trauma, infection, ischemia, and acute inflammation. SIRS involves a defensive release of chemicals within the body that can become a dysregulated cytokine storm. [Link](#) When this response is exacerbated and flows over into multiple systems, it contributes to the onset of sepsis. The hypercoagulative component of sepsis is also caused by over-release of cytokines, as they inhibit the breakdown of fibrin in blood clots, potentially leading to microvascular thrombosis, a condition in which fibrin or platelet rich clots occlude small blood vessels throughout the body. Thrombosis occurs in severe infection, cancer, stroke, and various other medical conditions and can lead to organ dysfunction, and in some cases eventually failure. ([link](#)) Since severe sepsis is defined by “dysfunction of one of the major organ systems or unexplained metabolic acidosis,” thrombosis can contribute and lead directly to sepsis. (Jacobi, 2002, p. 1).

Sepsis is characterized by hypo or hyperthermia, tachycardia, tachypnea, pain, diaphoresis, and abnormally high or low white blood cell levels. (Jacobi, 2002, p. 1). Sepsis can be recognized when any combination of these symptoms is present with a suspected infection and higher mortality can be suggested with an EtCO₂ reading of 25 mm or less. EtCO₂ stands for end-tidal carbon dioxide content. It is a vital sign that measures the amount of carbon dioxide in a patient's breath as they exhale, informing the clinician of the patient's quality of respirations. If this reading is below a certain threshold in conjunction with sepsis, the patient's chances of survival are lowered. To manage sepsis in the field, a variety of techniques are employed. Treatment is initiated with fluid resuscitation. Septic shock is characterized by a dangerous drop in blood pressure as a result of an infection. As it doesn't require oxygen-carrying fluids, the administration of isotonic solutions is acceptable to replenish blood volume and increase blood pressure. If the patient does not respond to aggressive fluid resuscitation, the administration of vasopressors, specifically 5-20 mcg/kg/min of dopamine, is indicated but can be controversial because of possible complications or overcorrections in the patient. ([link](#))

Sources:

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