Sepsis to Septic Shock

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**Sepsis to Septic Shock**

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**Background**

Sepsis has long been part of medicine and conceptualized using multiple definitions without consistent and reproducible criteria, making extensive pathophysiology associated with sepsis difficult to diagnose and treat. The CDC reports approximately 1.5 million patients are diagnosed with sepsis each year (Sepsis, 2016). Treatment guidelines are ambiguous and patients incur a prolonged hospital stay while receiving complex therapy. Patients diagnosed with sepsis reflect an in-hospital mortality risk of 10% and those who develop septic shock increase their mortality risk greater than 40% (Singer, et al., 2016). In 2016, a task force consisting of international healthcare clinicians who lead the world in sepsis pathophysiology, clinical trials and sepsis research convened a consensus to develop updated definitions and criteria related to sepsis. Singer, et al. (2016) proposed sepsis is a “life-threatening organ dysfunction caused by dysregulated host response to infection”. Furthermore, septic shock is the bodies deterioration affecting circulation and cellular metabolic homeostasis thus increasing mortality (Singer, et al., 2016). Outside the critical care environment, sepsis is often misdiagnosed thus increasing healthcare costs thru delay in treatment all while increasing patient mortality (Mouncey, et al., 2015).

**Signs & Symptoms**

**Sepsis**

- Specific to region related to primary offense: (e.g. cough/r't pneumonia, pain/r't non-healing wound, abdominal pain/r't pancreatitis)
- Hypotension (SBP < 90mmHg, MAP < 70mmHg)
- Temperature > 38.3°C or < 36°C
- Heart Rate > 90 beats/minute
- Tachycardia - RR > 20mm

**Laboratory Markers**

- Leukocytosis (WBC >12K) or Leukopenia (WBC < 4K)
- Hyponatremia, hyperglycemia (serum glucose > 144mg/dl)
- Arterial hypoxemia (PaO2/FiO2 < 300)
- Oliguria (LOP < 0.5ml/kg/hr)
- Thrombocytopenia (platelet < 100K)
- Hyperlactatemia (lactate >2mmol/L)
- Coagulation dysfunction (INR >1.5, aPTT>60 seconds)

**Septic Shock**

Clinical presentation includes previous signs/symptoms but the patient requires vasopressor support to maintain mean arterial pressure > 65mmHg and hyperlactatemia > 2mmol/L despite adequate fluid resuscitation. Septic shock represents an advanced diagnosis where circulatory, cellular, and metabolic abnormalities reflect increased patient mortality. Source: (Laszlo, et al., 2015)

**Pathophysiology**

Sepsis is a “life-threatening organ dysfunction caused by dysregulated host response to infection” (Singer, et al., 2016). The normal host reaction to pathogens involves adhesive immune response involving innate and adaptive immunity. Sepsis involves the pro-inflammatory mediators transitions beyond the local site to wreak systemic influences which become generalized (Laszlo, et al., 2015). Basic sepsis pathophysiology involves increased cardiac output when systemic vascular resistance is decreased given biventricular dysfunction. General abnormalities associated with sepsis include excessive alterations in endothelium along with microcirculatory impairment (Gotta & Matthes, 2016).

**Implications to Nursing Care**

In 2002, the Surviving Sepsis Campaign started a quality improvement initiative to improve knowledge related to sepsis, improve diagnosis, and develop guidelines of care. Amongst the various strategies is the Surviving Sepsis Campaign Bundles (SSC B). These guidelines focus care to satisfy elements that, when done collectively, improve patient outcomes. Nurses represent a vital role in the healthcare continuum for recognizing early signs and symptoms related to sepsis. Many healthcare institutions have customized the SSCB which allows the ICU nurse to initiate established protocol based on agreed upon criteria (Surviving Sepsis, 2015). One approved diagnostic tool is use of the quick SOFA (sequential organ failure assessment) score. A positive screen reflects 2 of 3 criteria including: respiratory rate > 22 bpm, Glasgow coma scale < 15, and/or SBP < 100 mmHg (Gotta & Matthes, 2016).

**Risk Factors**

Infecting Microorganisms: Pathogens associated with sepsis are predominately derived from the blood stream, lungs, kidneys and GI tract.
- Gram Positive: 47%
- Gram Negative: 26%
- Fungal: 19%

Source: (Gotts & Matthes, 2016)

**References**


https://www.mdpi.com/1999-4915/8/5/5338


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**Conclusions**

Patients suffering from invading microorganism develop sepsis that often deteriorates to septic shock. It is a common disease process with a vast and complex progression through multiple systems in the body. The dynamic nature of sepsis leads to challenges in the management of sepsis. The overwhelming and sometimes contrasting nature of proven treatments leads to it being a deadly and expensive diagnosis seen throughout healthcare. Since national consensus and guidelines have been implemented there has been improvements in outcomes, while the rate of sepsis has also increased. This is due to vigilance in disease identification, rapid delivery of antibiotic therapy, and supportive treatments to subsequent organ failure. Critical care nurses play a vital role in early detection and initiation of sepsis protocols

Critical to improving patient mortality requires the bedside nurse to understand sepsis pathophysiology, signs and symptoms, and anticipate disease progression while monitoring the patient clinical response to treatment.