The Pathophysiology of Sepsis

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Sepsis
Sepsis is a life-threatening medical condition caused by an aggressive inflammatory response to an infection, which, if not treated properly, can lead to organ failure or death.

Pathophysiological Process

Disease Process

The systemic response to severe infections leads to a lowered ability to fight infections, which can result in sepsis or multiorgan failure (Lord, McLeay, & McLeod, 2014). By understanding the pathophysiology of sepsis, healthcare providers will be able to recognize early signs and symptoms of this inflammatory disease process and implement early medical management.

Signs & Symptoms

Sepsis can be difficult to diagnose because the signs and symptoms of sepsis can be subtle and often mimic other disorders (Lopes-Rodriguez, Demaray, & Jan, 2014).

To diagnose SIRS, a patient must meet 2 of the following 4 criteria:

- Hyperthermia or hypothermia.
- Leukocytosis or leukopenia.
- Tachycardia.
- Tachypnea.

Other possible manifestations of SIRS may include:

- Hypertension in patients who do not have diabetes.
- Increased proinflammatory cytokines.
- Increased pro-inflammatory cytokines.
- Altered mental status.

Information retrieved from (Cawcutt & Peters, 2014).

Table 1: Definitions of Systemic Inflammatory Response Syndrome (SIRS)

<table>
<thead>
<tr>
<th>SIRS</th>
<th>Meets 2 of the following 4 criteria:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIRS</td>
<td>• Heart rate &gt; 90 beats/min</td>
</tr>
<tr>
<td></td>
<td>• Temperature &gt; 100°F or &lt; 98.6 degrees F</td>
</tr>
<tr>
<td></td>
<td>• White blood cell count &lt; 5,000 or &gt; 12,000/mm or &lt; 4,000/mm or &gt; 10,000/mm</td>
</tr>
<tr>
<td></td>
<td>• Respiratory rate &gt; 20 breaths/min or &lt; 12 breaths/min</td>
</tr>
</tbody>
</table>

Table 2: Early Warning Signs of Sepsis

<table>
<thead>
<tr>
<th>SIRS</th>
<th>As a result of a documented or suspected infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIRS</td>
<td>• Fever</td>
</tr>
<tr>
<td></td>
<td>• Hypotension</td>
</tr>
</tbody>
</table>

Additional Sources

References


Underlying Pathophysiology

The inflammatory response is the body’s response to noxious stimuli. Neutrophils mediate cellular changes.

Vasodilation and inflammation occur.

The invading pathogenic microorganisms stimulate the release of cytokines.

Cytokines trigger an exaggerated inflammatory response.

Increased C-reactive protein.

The systemic response to severe infections leads to a lowered ability to fight infections, which can result in sepsis or multiorgan failure (Lord, McLeay, & McLeod, 2014).

The above information was retrieved from www.nutekmedicalcentremumbai.com

Sepsis, Septic Shock, and Multiple Organ Dysfunction Syndrome

Understanding the pathophysiology of sepsis is crucial to appropriate treatment interventions.

By carefully studying the pathophysiology of sepsis, healthcare providers have determined that the time required for survival can be identified, patient prognosis is poor (Lee, 2015). Urgent interventions should be taken for patients’ outcome and symptoms of septic shock are often manifestations of this disease process.

The sepsis component system has three primary responsibilities:

1. Recruitment of inflammatory cells to the site of infection.
2. Covering the bacterial membrane of the pathogen.
3. Destroying the pathogens.

By understanding the pathophysiology of sepsis and recognizing early warning signs of SIRS, we can appropriately treat patients.

Additional Sources


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References


The above information was retrieved from www.nutekmedicalcentremumbai.com

Implication for Nursing

Investigating the pathophysiological process of sepsis has allowed clinicians to formulate evidence-based treatment bundles for improving the outcome for septic patients.

Altered Compensatory Mechanisms

- Tachycardia can be due to inappropriate response to lactic acidosis.

- The leukocyte count is elevated in sepsis to combat the infection.

- Decreased capillary refill may be indicative of sepsis.

- Increased C-reactive protein levels can be seen in sepsis.

- Worsening kidney functioning or respiratory issues.

- The inflammatory response disrupts normal coagulation and can lead to fibrin and platelet plugs.

- Depressed neurologic function is also often present due to inflammation affecting neurons, glial cells, and endothelial cells which induce breakdown of the blood brain barrier.

Additional Sources


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