Ortho Science Bytes:
Understanding Sepsis, Its Detection, and Treatment Strategies

Key Takeaways

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What is sepsis?

- Life-threatening organ dysfunction caused by a dysregulated host response to infection.
- The immune system attacks the organs as well as the infected organism that started the infection.
- All organs are affected by the dysregulated host response.

Who is at risk of getting sepsis?

- Children, especially neonates
- The elderly
- Hospitalized patients
- Individuals who have had a recent hospitalization
- Immunocompromised individuals
- Individuals without a spleen

What acronyms have been developed to spot the warning signs of sepsis?

Sepsis Alliance:

- TIME™: Watch for changes in **Temperature** (higher or lower than normal), **Infection**, **Mental** decline (confused, sleepy), **Extremely** ill (severe pain, discomfort, shortness of breath)

The UK Sepsis Trust:

- SEPSIS: **S**lurred speech, **E**xtreme shivering or muscle pain**, P**assing no urine (in a day), **S**evere breathlessness, **I**t feels like you're going to die, **S**kin mottled or discolored

What surveillance measures are used to rapidly detect the onset of sepsis in hospitalized patients?

- Clinical signs
- Heart rate: anything over 100 should be viewed with suspicion
- Falling blood pressure
- Arterial puncture
- Amount of oxygen in the blood
- Blood pH
- Lactate: raised levels have been shown to be an indicator of poor outcomes in patients with sepsis.
- White blood cell count and neutrophil count
- C-Reactive Protein (CRP): raised levels would increase the suspicion of sepsis
- Procalcitonin (PCT): helps to differentiate between viral and superadded bacterial infection.

How is sepsis treated?

- The mainstay of treatment is timely, appropriate antibiotics.
- Tailor the treatment to the pathogen once identified.
- The use of procalcitonin can help tailor when to stop the use of antibiotics.

How can sepsis negatively impact the kidney?

- Some antibiotics used to treat sepsis are nephrotoxic.
- PAMPs - Pathogen Associated Molecular Patterns can trigger more dysregulated activation of the immune system, and DAMPs - Damage-Associated Molecular Patterns, which come from our own cells and tissues- can damage the kidneys.
- A fall in blood pressure leads to a reduction in perfusion of the organs like the kidneys.

What biomarkers can be used to detect acute kidney injury?

- The Nephrocheck® test consists of two biomarkers for the early detection of acute kidney injury using a urine sample*.

What could be done for a patient with suspected sepsis and positive biomarkers for acute kidney injury?

- Ensure there is appropriate profusion pressure for the kidney.
- Give fluids to the patients with acute kidney injury early and in a targeted fashion to maintain fluid within the vascular compartment.

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