

MCQs on Sepsis: Immunopathology, Epidemiology, and Management – Medical Immunology

1. Which of the following best describes the initial immune response in sepsis?

- A) Excessive IL-10 production
- B) Hyperactivation of proinflammatory cytokines
- C) T-cell anergy
- D) Complement inhibition
- E) Suppression of innate immunity

2. A 65-year-old diabetic patient develops sepsis after urinary tract infection. The most common causative organism is:

- A) *Pseudomonas aeruginosa*
- B) *Escherichia coli*
- C) *Klebsiella pneumoniae*
- D) *Enterococcus faecalis*
- E) *Staphylococcus aureus*

3. The term 'cytokine storm' in sepsis refers to:

- A) Increased complement activation
- B) Massive release of proinflammatory cytokines
- C) Overproduction of antibodies
- D) Failure of macrophage activation
- E) Excessive apoptosis of lymphocytes

4. The most common site of infection leading to sepsis in hospitalized patients is:

- A) Urinary tract
- B) Skin and soft tissue
- C) Respiratory tract
- D) Gastrointestinal tract

E) Central nervous system

5. In septic shock, the primary cause of hypotension is:

A) Cardiac depression

B) Hypovolemia

C) Vasodilation due to nitric oxide release

D) Reduced renin-angiotensin activity

E) Adrenal insufficiency

6. A 40-year-old man in septic shock has elevated procalcitonin. This marker indicates:

A) Viral infection

B) Bacterial infection severity

C) Fungal infection

D) Autoimmune activity

E) Drug toxicity

7. Which complement component is primarily involved in sepsis-induced inflammation?

A) C1q

B) C3a and C5a

C) C7

D) Factor B

E) C9

8. The Surviving Sepsis Campaign recommends which of the following as part of initial management?

A) Immediate corticosteroid administration

B) Broad-spectrum antibiotics within one hour

C) Delayed fluid resuscitation

D) Vasopressors before fluids

E) Immunosuppressive therapy

9. The predominant cause of death in late-stage sepsis is due to:

A) Persistent hyperinflammation

B) Immunosuppression and secondary infections

C) Cytokine deficiency

D) Complement depletion

E) Acute allergic reactions

Answers and Explanations

1. Answer: B

Explanation: Early sepsis is characterized by uncontrolled activation of proinflammatory cytokines (IL-1, IL-6, TNF- α), leading to systemic inflammation.

2. Answer: B

Explanation: E. coli is the most frequent cause of urosepsis, especially in elderly and diabetic patients.

3. Answer: B

Explanation: Cytokine storm describes overwhelming release of cytokines like TNF- α , IL-1 β , and IL-6, contributing to vascular leakage and organ failure.

4. Answer: C

Explanation: Pneumonia is the leading cause of sepsis in hospitalized and ICU patients.

5. Answer: C

Explanation: TNF- α and nitric oxide induce systemic vasodilation and capillary leak, causing hypotension in septic shock.

6. Answer: B

Explanation: Procalcitonin is a biomarker for bacterial sepsis and correlates with infection severity and prognosis.

7. Answer: B

Explanation: Anaphylatoxins C3a and C5a amplify inflammation and contribute to endothelial injury during sepsis.

8. Answer: B

Explanation: Prompt administration of broad-spectrum antibiotics within one hour of recognition improves survival in sepsis.

9. Answer: B

Explanation: Following initial hyperinflammation, sepsis often transitions into an immunosuppressive phase, predisposing to secondary infections.