Disclosure Information

- I, Catherine S. Thomas, the planner and presenter have no real or perceived vested interest related to this presentation.

Session Objectives
By conclusion of session, participants will:

- Learn impact of sepsis care on healthcare costs, types & clinical manifestations of sepsis, be able to recognize at risk populations
- Reinforce skills related to prevention, early recognition/intervention, develop ability to provide focused effective care to survivors
- Be introduced to latest treatment guidelines and online resources
- Be able to clarify any areas of knowledge related to sepsis and nursing care

Introduction
No longer considered an ICU disease

Begins at home, in LTC facilities, or at other hospitals

Can be admitted to practice floor, operating or recovery room, or to ICU

Sepsis is a global term that is often misused

Sepsis Statistics

- Incidence has ↑ 83% over last decade – 2/3 of patients were > 65 years old
- 6th most common principal reason for US hospitalization – 1 in every 12
- As secondary diagnosis - accounted for additional 829,500 admissions
- 2009 - most expensive reason for hospitalization totaling nearly 15.4 billion dollars
- Other recent estimates = 20 billion annually

Sepsis Statistics

- Mortality rates: Sepsis = 15-20%, Severe Sepsis = 20-40%, Septic Shock = 20-47%
- Of 5 primary ICU admission diagnoses – ranked 4th
- 2nd leading cause of death of non-coronary ICU patients: 25 – 30% mortality rate
- Complications: 51% AKI, 18% acute respiratory failure, 80% myopathy or polyneuropathy

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Lay Definition of Sepsis
International (Merinoff) Definition - Global Sepsis Alliance:
“A life-threatening disease that arises when the body’s response to an infection injures its own tissues and organs. Sepsis can lead to shock, multiple organ failure and death if not recognized early and treated promptly. Sepsis remains the primary cause of death from infection despite advances in modern medicine, including vaccines, antibiotics and acute care.”

Sepsis Continuum - Definitions
• **Severe Sepsis**: Sepsis + sepsis-induced organ dysfunction and/or failure or tissue hypoperfusion
• **Septic Shock**: Evidence that tissues/organisms are not receiving sufficient oxygen and nutrients, + impaired perfusion - despite adequate fluid resuscitation

Pathophysiology Overview
• Inflammatory response is normal & desirable
• Response to mechanism of injury is complex – involves many chemical & biological factors - greatly individualized
• Injury results in production of endotoxins & exotoxins – induce cellular responses – initiates cascade of events: inflammation, coagulation, fibrinolysis
• Sepsis differs greatly from infection

Inflammation
• Normally useful – localize toxin effect & induces a response to kill invading organism
• When extreme – leads to vascular congestion, endothelial injury & overstimulation of coagulation system
• Histamine release: vascular effects – results in vascular permeability
• Complement system trigger may result in massive inflammation & endothelial dysfunction

Coagulation
• Closely associated with inflammation: mediators promote coagulation directly or indirectly
• Cytokines activate tissue factor, which is principal activator of coagulation & endothelial injury activates factor XII – together cause domino effect of activating factors ⇒ thrombin formation
• Thrombi also form due to circulating levels of APC
• Thrombi may act as emboli that block microvascular flow causing cellular death – ultimately organ dysfunction

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Fibrinolysis

- Normally occurs to create equilibrium between clot formation and breakdown
- Inhibited by endothelial injury and inflammation
- Increased presence of Thrombin also inhibits

Causative Organisms

- Varies between countries, age groups & sources of infection – many times it is NOT identified
- Changes have occurred over past 2 decades:
  - Before 1980’s, gram – more common. Fungal sources increasing
- Most common gram + (> 5% of patients):
  - Staphylococcus aureus, Streptococcus pneumoniae
- Most common gram –:
  - E Coli, Klebsiella pneumoniae, Pseudomonas aeruginosa
- Fungal infections - higher fatality rates

At Risk Populations

- Most frequent sites of infection:
  - Respiratory, Abdomen, Blood (primary bacteraemia)
  - Males: higher rates - respiratory, women: higher rates - UTI
- Age is strong predictor – if 65+, 13 times more likely to develop
- Males & non-white patients have ↑ risk
- Presence of chronic disease(s)
- Cancer patients have highest rate & have worst outcomes
- ¾ of all HAI are: surgical site, central line associated bacteraemia, VAP, urinary catheter associated infections – any increase risk of sepsis

Clinical Presentation

- Recognition of at risk & surveillance of all patients:
- Assessment of for:
  - Lungs, bowel dysfunction, wound infection (drainage)
- Monitoring of:
  - vital signs (including SpO2)
  - urine output (with concern – hourly)
  - mental status (including Glasgow Coma Scale)
  - coagulation status (labs & signs)
  - pertinent lab values/trends
  - fluid balance
  - indwelling catheters

Clinical Presentation – Early/Late

- Early:
  - Systemic vasodilation
    - Flushed, full bounding pulse, rapid capillary refill, increase in RR, HR and altered mental state. Initial rise in DBP. Reduction in UO
  - Late:
    - Lack of oxygenation and loss of venous return
      - Drop in BP, alterations in temperature, decreased skin perfusion, decreased capillary refill or mottling

Surviving Sepsis Campaign

- 2002: international collaboration formed by several stakeholder organizations
- 2008: published evidence based interventions “bundles”
- 2012: updated evidence based interventions
- Organized into 3 categories:
  - Recommendations directly targeting management of severe sepsis, recommendations targeting high-priority general care considerations, & pediatric considerations
  - Time sensitive treatment protocols

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Care Bundles & Nursing Care

- Fluid Therapy
  - Crystalloids
  - Artificial colloids
- Specimen Collection
- Antibiotic Therapy
- Oxygenation

Interventions: Severe Sepsis/Shock

- Vasopressors
  - Norepinephrine, Epinephrine, Vasopressin, Dopamine
- Inotropic Therapy
  - Dobutamine
- Steroid Use
- Blood Product Administration
- Mechanical Ventilation
- Drotrecogin alfa (activated) infusion

ICU Complications

- Pressure Ulcer
- DVT/Stress Ulcer Prophylaxis
- Deconditioning/Mobility
- Nutrition
- ICU Delirium

Survivors – Delivering Focused Care

- More likely to require post-hospitalization medical care – close to 50% require subacute/LTC
- Post ICU Syndrome renewed area of focus
- Needs related to:
  - Activity, Rehab (OT & PT)
  - Nutrition
  - Relocation stress/transfer anxiety
  - Cognitive impairment
  - Depression

Web Based Resources

- CDC – Sepsis pages: www.cdc/sepsis/
- Surviving Sepsis Campaign – treatment bundles and other resources: www.survivingsepsis.org
- American Association of Critical Care Nurses – free 30 minute webinar from May 2013 – under education/webinar: www.aacn.org

Web Based Resources

- Institute for Healthcare Improvement – info under topics and resources: www.ihi.org
- Sepsis Alliance has page for world sepsis day – several printable resources: www.world-sepsis-day.org
- International Sepsis Forum – recorded presentations under resources: www.internationalsepsisforum.org
- World Federation of Critical Care Nurses: http://wfccn.org/publications-index

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Web Based Resources

- iTunes & Google play (Android) apps:
  - Survive Sepsis by J.Richardson – free
  - Sepsis Clinical Guide by Escavo – free

Conclusion

- Evolving body of research and knowledge
- Increased interest in survivorship
- Electronic Health Records & Early Warning Systems have & will guide & support care
- Nurses can have significant impact

References


References


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