

Severe Sepsis

Evaluation and Treatment

2011

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- 1) Case Presentation.....Dr. Frederick
 - 2) Severe Sepsis Screening Tool.....Dr. Salman
 - 3) Severe Sepsis Bundle.....Dr. Dailey
 - 4) Focus Issues for NFH
 - a) Central Lines
 - b) ICU transfer in 1-2 hours
 - c) Complete bundle up to Xigris decision in 6 hours.
 - d) B-blockers
 - 5) Discussion

Evaluation for Severe Sepsis Screening Tool

Instructions: Use this evaluation tool to screen patients for **suspected** severe sepsis.

1. Is the patient's history suggestive of a NEW infection?

- | | |
|--|---|
| ☐ Pneumonia, empyema | ☐ Bone/joint infection |
| ☐ Urinary tract infection | ☐ Wound infection |
| ☐ Acute abdominal infection | ☐ Endocarditis |
| ☐ Meningitis | ☐ Skin/soft tissue infection |

- ☐ Bloodstream catheter infection
☐ Implantable device infection
☐ Other

Yes _____ No _____

2. Are any two of the following signs & symptoms of infection both present and NEW to the patient?

- | | | |
|--|---|---|
| ☐ Hyperthermia > 38.3 °C
(101.0°F) | ☐ Tachypnea > 20 bpm | ☐ Leukopenia (WBC count < 4000 µL-1) |
| ☐ Hypothermia < 36 °C
(96.8°F) | ☐ Acutely altered mental status | ☐ Bands 10% or greater |
| | ☐ Leukocytosis (WBC count > 12,000 µL-1) | |

Yes _____ No _____

☐ If the answer is yes to both question 1 and 2, suspicion of infection is present:

- Notify physician and obtain lactic acid, blood cultures, CBC with differential, CMP, UA, Chest x-ray.
- Call RRT when appropriate

☐ If the answer is no to both question 1 and 2, reassess **if clinically indicated in four hours.**

3. Are any of the following organ dysfunction criteria present?

(One box checked indicates severe sepsis:)

- ☐ SBP < 90 mmHg or MAP < 65 mmHg
- ☐ SBP decrease > 40 mmHg from baseline
- ☐ Pneumonia with a **new (or increased)** oxygen requirement of >3 liters to maintain SpO2 > 90% or double the baseline requirement or PaO2.FiO2 ratio < 300
- ☐ Creatinine > 2.0 mg/dl (176.8 mmol/L) or Urine Output < 100ml for 2 hours
- ☐ AST/ALT level > 90 or double from baseline
- ☐ Platelet count < 100,000
- ☐ Coagulopathy (INR > 1.5 or aPTT > 60 secs)
- ☐ Lactate > 2 mmol/L (18.0 mg/dl)

Yes _____ No _____

☐ If **suspicion of infection is present AND organ dysfunction is present**, the patient meets the criteria for **SEVERE SEPSIS**

- ☐ Call physician
- ☐ Initiate Severe Sepsis Bundle
- ☐ Consult for CVL Placement

Signature: _____

Date: _____ Time of recognition: _____:_____ (24 hr clock)

Place patient label here

Severe Sepsis Bundle

I) **Fluid resuscitation**

- a) normal saline if hypotensive/hypovolemic
- b) one half normal saline if normotensive (less edema)
- c) per EGDT guidelines

Rivers et al Early Goal Directed Therapy NEJM 2001

Severe Sepsis Bundle

2) **O₂ /Ventilatory support**

- a) if $\text{PaO}_2/\text{FiO}_2 < 200$, consider ventilator
- b) 6 ml/Kg ideal body weight = tidal volume
- c) plateau pressure goal <30

Severe Sepsis Bundle

3) **Pressors**

a) Levophed

-or-

b) Dopamine – consider alternative if
tachyarrhythmia or severe cardiac
dysfunction

c) Vasopressin

Severe Sepsis Bundle

4) Antibiotics

- a) CAP
- b) UTI
- c) Intra-abdominal
- d) Skin and soft tissue

IDSA/ATS guidelines

Severe Sepsis Bundle

5) **Steroids**

- a) hydrocortisone 50 mg q6h
(<300 mg per day)

6) **Metabolic acidosis** (lactic acidosis)

- a) Na bicarbonate to keep $\text{pH} > 7.1$
- b) Turn off source!!

Severe Sepsis Bundle

- 7) Immunoglobulins** (consider if)
 - a) Respiratory pathogens (i.e. severe pneumococcal disease)
 - b) Toxin-based process (i.e. C.difficile)
 - c) Chronic steroid use-measure IgG
 - d) CVID or acquired immunodeficiency
 - e) Toxic Strep or Staph (MRSA) not responding

Severe Sepsis Bundle

8) **Xigris**

- a) consider if unresponsive to aggressive resuscitation after 6 hours and
- b) >2 organ failure (i.e. mortality is greater than 50%)
- c) no contraindications to Xigris
- d) or an Apache score >25

Severe Sepsis Bundle

9) Fluid Overload

- a) CRRT
- b) Dialysis

10) Hemolytic Uremic Syndrome

All thrombocytopenia is not sepsis. Some patients may need **plasmapheresis** and not fresh frozen plasma (i.e. DIC).

Severe Sepsis Bundle

11) Glucose Control

Goal = glucose 100-150

12) Prone Bed

May help if ARDS or severe pneumonia and hypoxia is not correctible with maximum ventilator support.

Severe Sepsis Bundle

- 13) The goal of resuscitation from severe sepsis should focus on the **total septic picture**.

Lactate clearance or ScvO₂ are extra tools for difficult cases to assist in evaluating the efficacy of resuscitation.

B-blockers in Sepsis

- 1) B-blocker therapy for septic cardiac shock: fiction or realism. Bendjelid K. Current Drug Therapy 1(2) 2006:131-133.

“No clinical data are available.”

“Not established, nor recommended. It should only be applied under controlled clinical trials.”

B-blockers in Sepsis

- 2) Relative tachycardia in patients with sepsis: an independent risk factor for mortality. QJM 100(10) 2007:629-634.
 - a) observational study
 - b) no association of **tachycardia** with septic shock mortality

B-blockers in Sepsis

- 3) B-blockers in sepsis: reexamining the evidence. Shock 31(2) 2009:113-119.
“A growing body of evidence is lending support to the idea that B-blockade might warrant institutional review board-approved human trials in select patients, possibly giving Berk, et al. (ca 1970) their long-awaited clinical trial.”
- 4) Medical legal evidence

Critical Issue

“The average time from meeting the diagnostic criteria to infusion of the study drug was approximately 12 hours (the maximum was 24 hours, according to the entry criteria). Studies by Rivers et al.⁷ and Kumar et al.⁹ suggest that cardiovascular and antimicrobial therapies initiated earlier (within 6 hours after the onset of septic shock, and preferably within 1 or 2 hours) result in the highest survival rates. Treatment initiated at an average of 12 hours after the onset of septic shock may be too late for any vasopressor agent to show a significant effect on mortality.”

Parillo JE. Septic Shock – Vasopressin, Norepinephrine, and Urgency. N Engl J Med 2008; 358:954-956



Important Sepsis Issues at NFH

- 1) Central Lines
- 2) Early Transfer to ICU
- 3) Early Xigris Decision

In Sepsis

- Timing is everything.
- The clock starts with recognition.