Shock/Sepsis/MODS

Strategies for Early Recognition

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Shock/Sepsis/MODS

Strategies for Early Recognition

Shock/Sepsis/MODS?

- Increasing incidence of sepsis
- Sepsis common cause of death in ICU
- Understanding shock/sepsis/mods facilitates early recognition/intervention
- Shock is often factor in medical/nursing negligence

Understanding the Terms

Sepsis

SHOCK

SIRS

MODS

Continuum of Doom
SIRS: Pathophysiology

- Non-infectious
- Underlying Etiology
- Infectious
- Cytokine Released
- Homeostasis
- No Systemic Reaction
  - Cellular Injury
  - Healing
  - MODS

Clinical Presentation

- SIRS Criteria
  - Temp >100
  - Hear rate > 90
  - RR >20
  - WBC > 12,000 or < 4000
- Systemic Impact
  - Hypoxemia/ARDS
  - Decreased Urinary Output
  - Hypotension
  - Hyperglycemia

SIRS: Main Points

- Characterized by exaggerated inflammation/coagulopathy
- Not always related to infection
- "Equal Opportunist"
  - Age, sex, race
- Early recognition/intervention critical to patient outcome

Shock
Stages of Shock
As reflected in the medical record...

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Progress Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 0800</td>
<td>Re-assessment performed, vsis, no change in condition...</td>
</tr>
<tr>
<td>Compensatory 1420</td>
<td>Restless, states &quot;can't get comfortable,&quot; BP 102/62, P92, R22, O2 sat 90-92% on 1L/NC O2... BG 192 (see MAR).</td>
</tr>
<tr>
<td>Late 1900</td>
<td>BP 90/48, P 102, R 24 even, non-laborated, sleeping at longer intervals, arouses to touch...</td>
</tr>
<tr>
<td>2215</td>
<td>CODE BLUE called...</td>
</tr>
</tbody>
</table>

Pathophysiology of Shock

 Shock: Types

- Cardiogenic
- Hypovolemic
- Distributive Shock
  - Anaphylactic
  - Septic
  - Neurogenic

Cardiogenic Shock

Thirst, cool clammy skin

1 BP, Temp

DECREASED

Pumping

Volume

Vasomotor tone

Shock
Hypovolemic Shock

- Fluid Loss
  - Decreased intravascular volume
  - Decreased venous return

- Reduced Preload
  - Decreased stroke volume
  - Decreased cardiac output

- Decreased Perfusion
  - Decreased MAP
  - Decreased cellular oxygenation

MULTIPLE ORGAN FAILURE

Pathophysiology of Anaphylaxis

- Allergen
  - Histamine/leukotriene release
  - Smooth muscle contraction
  - Vascular dilation
  - Angioedema
  - Urticaria
  - Fluids shifts
  - Shock

Neurogenic vs. Spinal Shock

- Neurogenic Shock
  - Injury/Insult
  - Loss of vasomotor tone/vasodilation
  - Hypotension, Bradycardia, Poliklothermia

- Spinal Shock
  - Flaccid Paralysis

Septic Shock

- Maldistribution of blood flow
- Gram -
- Gram +
- Infection
- Permeability
- Microemboli
- Hypoperfusion
- MODS
Multi-Organ Dysfunction

Altered organ function as a result of progression of SIRS/Sepsis/Shock

- May be first clinical signs of sepsis
- Can be primary or secondary
- Physiological insults are triggers
- Characterized by hypoperfusion
  - Symptoms of shock
  - Bleeding
  - Mental status changes
  - Decreased urinary output
  - Labs: hypoxia/hypercapnia, liver enzymes/creatinine, prolonged PT/PTT

Septic Shock

<table>
<thead>
<tr>
<th>Clinical Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CV</strong></td>
</tr>
<tr>
<td><strong>RESP</strong></td>
</tr>
<tr>
<td><strong>NEURO</strong></td>
</tr>
<tr>
<td><strong>RENN</strong></td>
</tr>
<tr>
<td><strong>GI</strong></td>
</tr>
<tr>
<td><strong>HISTORY</strong></td>
</tr>
<tr>
<td>Labs: BG 170, WBC 3,800, BUN 22, CO2 49</td>
</tr>
</tbody>
</table>

Respiratory Distress/Failure

<table>
<thead>
<tr>
<th>Clinical Picture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypoxemia</strong></td>
</tr>
<tr>
<td><strong>Hypercapnia</strong></td>
</tr>
<tr>
<td><strong>Respiratory Acidosis</strong></td>
</tr>
</tbody>
</table>

- Headache, irritability, confusion, lethargy, dysrhythmia, tachycardia, bradycardia, hypotension, decreased cardiac output, cyanosis.
- Increased work of breathing
- Dypnea, exhaustion

- Increased right-sided heart pressure
- Peripheral edema, neck vein distention, Hepatomegaly

Shock/MODS: Medical Management

- Normal saline
- Lactated Ringers
- Drug Therapy
  - Vasopressors
  - Sodium Bicarb
  - Antibiotics
  - Steroids
  - Insulin

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Shock: Nursing Management

- Vital signs with O2 Sat
- I&O (renal/cardiac perfusion)
- Neuro assessment [cerebral perfusion]
- Lung Assessment [pulmonary perfusion]
- Nutrition
  - Enteral/Parenteral
- Labs: *monitoring and interpretation
  - ABG, Electrolytes, PT/PTT, glucose, CBC
References


