MATERNAL SEPSIS

Prof. Dr. Yaprak ÜSTÜN
1991 & 2001

SEPSIS STEPS

1991

American College of Chest Physicians and the Society of Critical Care Medicine
Bone et al. Chest. 1992;101:1644
<table>
<thead>
<tr>
<th></th>
<th>ESKİ</th>
<th>YENİ</th>
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<td><strong>SEPSIS</strong></td>
<td>Suspected infection + SIRS</td>
<td>Suspected infection + qSOFA ≥ 2 Or change in SOFA score of 2 points</td>
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<td><strong>SEVERE SEPSIS</strong></td>
<td>Sepsis + Hypotension, hipoxia, increased lactate</td>
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<td><strong>SEPTIC SHOCK</strong></td>
<td>Sepsis + Hypotension after fluid resusitation</td>
<td>Sepsis + Vasopressors + Lactate &gt; 2 mmol/L</td>
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# SOFA score (sepsis-related organ failure assessment, also called the sequential organ failure assessment)

<table>
<thead>
<tr>
<th>SOFA Score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>Respiration: Pao₂/Fio₂</td>
<td>&lt;400</td>
<td>&lt;300</td>
<td>&lt;200, with respiratory support</td>
<td>&lt;100, with respiratory support</td>
</tr>
<tr>
<td>Coagulation: platelets</td>
<td>&lt;150,000/mm³</td>
<td>&lt;100,000/mm³</td>
<td>&lt;50,000/mm³</td>
<td>&lt;20,000/mm³</td>
</tr>
<tr>
<td>Liver: bilirubin (mg/dL)</td>
<td>1.2–1.9</td>
<td>2.0–5.9</td>
<td>6.0–11.9</td>
<td>&gt;12.0</td>
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<tr>
<td>Cardiovascular: hypotension</td>
<td>MAP &lt;70 mm Hg</td>
<td>Dopamine ≤5 µg/kg/min, or Dobutamine (any dose)</td>
<td>Dopamine &gt;5 µg/kg/min, or Epinephrine ≤0.1 µg/kg/min, or Norepinephrine ≤0.1 µg/kg/min</td>
<td>Dopamine &gt;15 µg/kg/min, or Epinephrine &gt;0.1 µg/kg/min, or Norepinephrine &gt;0.1 µg/kg/min</td>
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<tr>
<td>CNS: Glasgow Coma Score</td>
<td>13–14</td>
<td>10–12</td>
<td>6–9</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Renal: serum creatinine or urine output</td>
<td>1.2–1.9 mg/dL</td>
<td>2.0–3.4 mg/dL</td>
<td>3.5–4.9 mg/dL, or Output &lt;500 mL/d</td>
<td>&gt;5.0 mg/dL or Output &lt;200 mL/d</td>
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**INFECTION + SOFA ≥ 2**
Quick SOFA emergency + bedside

How can you measure qSOFA?

Three criteria:

- Altered mental status: Glasgow Koma Skoru < 15
- Fast respiratory rate: Solunum sayısı > 22/dk
- Low blood pressure: Sistolik kan basınıncı < 100 mmHg

2 or more criteria suggests a greater risk of a poor outcome.
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Mottling score

0 – No mottling
1 – Coin sized mottling area on the knee.
2 – To the superior area of the knee cap.
3 – Mottling up to the middle thigh
4 – Mottling up to the fold of the groin
5 – Severe mottling that extends beyond the groin.

Quelle: Ait-Oufella et al., Intensive Care Med 2011

Mikrocirculatory dysfunction in septic shock
## INFECTIOUS DISEASES

<table>
<thead>
<tr>
<th></th>
<th>2012 (n,% )</th>
<th>2013 (n,% )</th>
<th>2014 (n,% )</th>
<th>2015 (n,% )</th>
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<tr>
<td>Direct</td>
<td>5 (2.6)</td>
<td>9 (4.0)</td>
<td>14 (6.6)</td>
<td>4 (2.2)</td>
</tr>
<tr>
<td>Indirect</td>
<td>8 (4.2)</td>
<td>28 (12.5)</td>
<td>21 (9.9)</td>
<td>25 (13.7)</td>
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CAUSES OF SEPSIS IN PREGNANCY

- Pregnancy related infections
  - Chorioamnionitis
  - Endometritis
  - Wound infection
  - Perineal infection
  - Mastitis
  - Infection related to regional anesthesia
  - Septic abortion
  - Septic pelvic thrombophlebitis

- General infections
  - Pharyngitis
  - Gastroenteritis
  - Pneumonia
  - Hepatitis
  - UTI
  - Pyelonephritis
  - Chicken pox
  - Malaria
  - HIV
  - Appendicitis
Case

• 33 y, 5G, 4 P, 24 w
• Fever for 3 days; 38.4 °C
• Urine: 90 WBC, 3-4 erit, Nitrit: (+)
• Hb:8.7, Plt: 54.000, BK:8400, neutrophil %92.3 CRP:130.9
• 2 d hospitalization for cystitis: RL, paracetamol, metoclopramide, ceftriaxon, discharged

Qsofa? SOFA>2
After 2 days new admission

Blurred mental status

36.2 °C

Pulse:110/dak

TA: 90/60 mmHg

Hb: 7.6, BK: 4570, Plt: 12000

INR: 1.76 PT:20.8, aPTT 57

Creatinine 1.8

AST: 521, ALT:131

CRP:200

ICU, dialysis, transfusion, ex

Qsofa=2  SOFA>5
Asemptomatic bakteriuria

First trimester screening

Agent
Fosfomysin
Nitrofurantoin

Dose
3 g
2x100 mg

Safe

Duration
Single dose
3-7d

Oral
Sepsis Survival Campaign 1 hour

1. Examine air tract
   - Examine respiration
     - 1st Hour
       1. Oxygen
       2. Antibiotic
       3. IV fluid resuscitation

2. Entubation

3. Culture
   - Laboratory tests (CBC, lactate)
   - Urine output

Crystalloid 20 ml/kg 1 hour (First 500 ml in 15-30 min)
Oxygen
Blood culture
Serum lactate, hb
Iv fluid
Broad-spectrum antibiotic
Urine output

High flow Pulse oximetry

SEPSIS SIX
Oxygen
Blood culture
Serum lactate, hb
Iv fluid
Broad specturum antibiotic
Urine output

SEPSIS SIX

Crystalloid
20 ml/kg 1. hour
(First 500 ml in 15-30 min)

Bed site USG
CVP
Leg raise test
Oxygen

Blood culture

Serum lactate, hb

Iv fluid

Broad specturum antibiotic

Urine output

SEPSIS SIX

Administer within the 1st hour
At least 7-10 days
Amoksisilin-Clavulanat + metronidazol
OR
Sefuroksim + Metronidazol
OR
Sefotaksim + Metronidazol
Gentamisin + clindamisin + penisilin

(Gentamisin 80 mg 8 h + Ampisilin 2 gr 6h + Klindamisin 900 mg 8 h)

OR

Vankomisin + piperasilin-tazobactam

(Vankomisin 1 gr 12 h + Piperasilin-tazobaktam 4.5 gr 8 h)
CASE

- 29 y, G: 4, P:3, A:0 ve Y:3
- **10.01.2016** Emergency Dep: 22 w, cough, 38 °C, acute sinusitis, 1000 cc SF + parol tx
- **17.01.2016** fever, dyspnea, syanotic, resp 50/min, SPO$_2$ %75, entubated, WBC:1.4, HB:10, CRP: 126
- H1N1 + Oseltamivir, meronem, azitromisin
- **05.02.2016** arrest
- Diagnosis: Pneumonia (H1N1 (+)) ARDS, Sepsis, ex
Pregnancy + Fever

- October-April
- ≥ 38 °C
- Cough, sore throat, malaise, diarrhea, headache

CONSULTATION

Oseltamivir 75 mg 2X1/d
Hospitalization Criteria

- Dispnea or respiratory stress
- Change in vital signs
  - Hypotension (systolic < 90 mmHg)
  - Tachypnea (30/min)
  - Heart rate > 120/min
- Hypoxia (sPO2 > %92)
- Mental status change
- Pneumonia on graph
VACCINE

- Inactivated virus
- OCTOBER-NOVEMBER
- Anytime in pregnancy
- Protects newborn till 6 months
- Protection for 1 year

(CDC, ACOG, ACIP)
CASE

- 35 y, G: 1, IUI pregnancy, multiple pregnancy
- **Cerclage** at 12 w
- **PROM** at 27 w, hospitalization not accepted
- 2 d later emergency dep with pain, TA: 100/70 mmHg, Urine: Plenty WBC, **CRP: 18.2**, WBC: 10.800, **Plt: 55 bin**, Hb: 13.7, FHR (+), fluid tx
- 1 d later emergency dep with dyspnea TA: 90 / 40 mmHg, Pulse: 64/min, 36.3°C, REFERRAL
- TA: 80/62 mmHg, Pulse: 134/dk, 36 °C, resp 28/min, USG FHR -/-, C/S. Bad odor of uterus
- Postop fever 40.7 °C, hypotensive, arrest, ex
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Postop fever 40.7°C, hypotensive, arrest

Twin + short cervix + cerclage-Preterm labor 2.15 X↑

Twin + short cervix + progesteron-Preterm labor ↓
35 y, G: 1, IUI pregnancy, multiple pregnancy

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**< 37 w PPROM**

Chorioamnionitis 34 % ↓ by antibiotic prophylaxis
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**7 day treatment**
- First 2 days Ampisillin 4 X 2 g
- Following 5 days Amoxicilin 3 X 500 mg
- Single dose 1g Azitromisin
CASE

- Multiple pregnancy
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PROTECTION

- Prophylactic ant in PPROM
- Vaginal examination <8
- Group B strep. prophylaxis
GBS culture + Newborn with GBS
GBS bacteriuria
Intrapartum fever
Labor < 37 w
≥ 18 h membrane rupture

From the beginning of labor till delivery
Penicillin G
5 milyon U
Then 3 milyon U6X1
IV
TARGETS IN SEPSIS

• CVP 8-12 mmHg
• O₂ sat ≥ %70
• MAP ≥ 65 mmHg
• Urine output ≥ 0.5 mL/kg/hr
Ks $\phi$  

TDP $\phi$  

HCO$_3^\phi$

Except cases refractory to vasopressors

Except bleeding
ES

Hb < 7 g/dl

Trombosit

< 10 000
< 20 000 + risk of bleeding

Stress ulcer prophylaxis

Proton pomp inh
H2 blocker

Thromboprophylaxis
CONCLUSION

MATERNAL MORTALITY DUE TO INFECTIOUS DISEASE

- Aseptomatic bacteriuria screening and tx
- Influenza vaccination
- Grup b streptococcus prophylaxis
Sağlık Bilimleri Üniversitesi
Zekai Tahir Burak Kadın Sağlığı Eğitim ve Araştırma Hastanesi