

Neonatal sepsis



Outline

- Neonatal sepsis
 - early onset sepsis
 - late onset sepsis

Early and Late onset sepsis

- Early onset sepsis (EOS) : before 72 hr of life
 - Vertical transmission : amniotic fluid & ascending infection from mother's ant-genital tract
 - common pathogen : GBS & gram negative bacilli (E.coli)
- Late onset sepsis (LOS) : greater than 73 hr of life
 - associated with indwelling foreign bodies

Sign & Symptoms of EOS

- Fever or hypothermia (< 35 °c)
- Hypotension or treated with fluid or vasopressors
- Cyanosis
- Tachycardia
- Respiratory distress
- Apnea and or bradycardia

Sign & Symptoms of EOS

- Abdominal distention or > 1 episode of bilious emesis
- Lethargy or irritability
- Acidosis
- Hypo/Hyperglycemia
- Neutropenia (ANC < 1000 mm³)

Lab

- CBC : perform at 6–12 hr after birth (EOS)
 - Absolute neutrophil count (ANC) and immature neutrophil (band form) count : poor accuracy
 - Neutropenia : good marker
 - Vary with GA, type of delivery, site of sampling, altitude
 - immature to total neutrophil (I:T) ratio : best sensitivity

Lab

- CBC : perform at 6–12 hr after birth (EOS)
 - EOS : associated with neutropenia and high I:T ratio
 - LOS : associated with
 - Leukocytosis or leukopenia
 - High ANC
 - High I:T ratio

Lab

- Platelet : non specific, insensitive, late indicator, remain lower days to weeks after sepsis episode
- Blood culture : amount > 1 ml
- Lumbar puncture : controversy, should be performed in
 - any infant with positive blood culture
 - Clinical course & Lab data suggest bacterial sepsis

Lab

- Urine culture : should be performed in LOS
- Gastric and tracheal aspirates, body surface culture :
no role
- C-reactive protein (CRP)
 - increase within 6–8 hr, peak at 24 hr
 - if CRP remain normal : bacterial sepsis is unlikely and antibiotics can be safely discontinued

Lab

- Procalcitonin :
 - Better sensitivity, less specific than CRP
 - increase within 2 hr, peak at 12 hr, normalized within 2–3 days

Treatment

- EOS
 - GBS and E.coli : ampicillin + aminoglycoside (gentamicin)
 - Synergistic activity against GBS and L.monocytogenes
 - Gram negative meningitis : cefotaxime + amonoglycoside

Treatment

- Duration
 - Bacteremia : 10 days
 - Uncomplicated GBS meningitis : 14 days
 - Gram negative meningitis : 21 days after negative culture

Asymptomatic infant

	< 37 wks	>= 37 wks	
chorioamniotitis	yes	yes	no
PROM >= 18 hr	yes	-	yes
Inadequate IAP	yes	-	yes
Investigation	H/C at birth ^{SEP} CBC +/- CRP at 6-12 hr		CBC +/- CRP at 6-12 hr
Management	<p style="text-align: center;">ATB</p> <ul style="list-style-type: none"> • Positive H/C : continue ATB + LP • Negative H/C, well, <u>abnormal lab</u> : continue ATB • Negative H/C, well, normal lab : discontinue ATB 		<p style="text-align: center;">No ATB</p> <ul style="list-style-type: none"> • Abnormal lab : H/C • Normal Lab : D/C

Group B streptococcus (GBS)

- Early onset : sepsis and pneumonia (24–48 hr)
- Late onset : meningitis
- Intra-partum antibiotic prophylaxis (IPA) : prevent GBS dis.

Group B streptococcus (GBS)

- Identification of candidates for IPA
 - Risk based approach :
 - delivery at < 37 wk
 - maternal temperature $\geq 100.4^{\circ}\text{F}$ (38°C)
 - ROM ≥ 18 hr
 - Culture based approach : screen all pregnant woman for vaginal and rectal GBS colonization between 35 & 37 wk

Intra-partum GBS prophylaxis Indicated

- Previous infant with invasive GBS disease
- GBS bacteriuria of the current pregnancy
- Positive GBS screening culture during current pregnancy

Intra-partum GBS prophylaxis Indicated

- Unknown GBS status at the onset of labor (culture not done, incomplete, or results unknown) and any of the following :
 - Delivery at < 37 wks
 - ROM \geq 18 hr
 - Intrapartum temperature \geq 100.4 F (38c)
 - Intrapartum NAAT positive for GBS

Intra-partum GBS prophylaxis

Not indicated

- Colonization with GBS during a previous pregnancy
- GBS bacteriuria during previous pregnancy
- Negative GBS screening culture during the current pregnancy, regardless of intrapartum risk factors
- cesarean delivery performed before onset of labor on a woman with intact amniotic membranes, regardless of GBS colonization status or gestational age

Summery of EOS Mx

- Start of ATB
 - Clinical symptoms : treat
 - Risk factors without clinical signs : mostly observe
 - Chorioamnionitis without clinical signs : mostly treat

Summery of EOS Mx

- Duration of ATB : re-evaluation within 48 hr, discontinue of infection is unlikely
- Cultures : blood culture : always
- LP : positive H/C or highly suspicion of bacterial sepsis

Case

การคลอดเกิดมารดาG1POGA 36 wk by u/s c PPRM

คลอดNL หลังคลอด APGAR Score 9-10-10 BW 2600gm

Case

หลังคลอด 4 ชม. การมีอาการหายใจหอบ

RR 78 /min Sat 97% BT 37.6 C PR 140 /min

No cyanosis no retraction no grunting

Case

- Late Preterm c maternal PPROM c tachypnea

Case

- Imp Neonatal Sepsis

Case

Management

Treatment :IV ATB,NPO,IV Fluid

Investigation : CBC,H/C,CXR

Case

- Treatment

NPO

10% DW 500 ml iv rate 7 ml/hr

DTX 100

O2 box 10 LPM

ATB : Ampicilin (100MKD) 260 mg iv q 12 Hr

Gentamicin (4MKD) 10 mg IV OD

Case

- Investigation

CBC WBC 21100 Hb18.9 Hct59.7% N 73 L19

ANC 15330

H/C no growth

CXR : Perihilar infiltration

Case

- F/U day 5 after ATB

BT 37.3 PR 120 RR 46 BP70/40

CBC WBC 11800 Hb 18.4 Hct 57.1% N55 L37

Thank you