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Post delivery antibiotics

Abstract

The need to know which babies need antibiotics after delivery and which are not is the main goal of this lecture.

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Emad Azer
Al Noor Hospital, UAE

Correspondence: Emad Azer, Al Noor Hospital, UAE, Tel 972000000000, Email reo558@hotmail.com

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Neonatal sepsis

Definition

It is a clinical syndrome of systemic illness accompanied by bactremia occurring in 1st month of life.

Incidence

Range from 1-8/thousand & reaches 13-27/thousand for B.W < 1.5kg. The mortality rate is 13-25% & higher rates are seen in premature.

Pathophysiology

- Early onset dis: Presents in 1st 5-7 days of life. Usually multisystem fulminent illness with prominent respiratory symptoms. Baby acquires infection during intrapartum period.
- Late onset dis: Presents after 5 days of life. Usually there is identifiable focus mostly meningitis in addition to sepsis. Source of organism are maternal genital tract & organisms acquired after birth from human contact & contaminated equipment.
- Nosocomial Sepsis: Seen in NICU sick babies with invasive technique & monitoring.

Causative organism

- GBS most common
- E. Coli Others Listeria, Staph, other strept, klebsiella

Risk factors

Prematurity & LBW: Most important factor L. B.W → increase risk of sepsis

i. PROM >18 h.

ii. Maternal Peripartum Fever >38 temp. Whatever its cause eg. UTI

iii. Amniotic Fluid Problems a foul smelling, eg. MSAF

iv. Resuscitation at birth esp. if need intubation

v. Multiple gestation

vi. Invasive Monitoring

Galactosemia → increase risk of E.coli sepsis.

Iron therapy → enhance growth of organism.

Others → eg. black>white

Diagnosis

a. Culture - esp. blood, urine, LP

b. Gram stain of various fluids

c. Others - CBC, CRP, Cytokine, IL6, surface neutrophil CD1(excellent early marker of sepsis)

d. Radiological - as CXR, Renal US

Treatment

I. GBS Prophylaxis: Screening for GBS at 35-37 weeks gestation, usually done aiming to discover mother with GBS early & treating them.

II. Initial Therapy: Usually Ampicillin + Aminoglycosides but in nasocomial sepsis Vancomycin + Aminoglycosides for staph coverage.

III. Continuing Therapy: Based on C&S

IV. Other treatment modalities: eg. Resp. support, BP support by blood or saline & dopamine, Vit.K and exchange transfusion to prevent &treat DIC. Also recomb. CSF for neutropenia.

V. Igs is also used (although no benefit till now).

VI. Vaginal and rectal screening cultures at 35-37 wk gestation for ALL pregnant women (unless patient had GBS bacteriuria during the current pregnancy or a previous infant with invasive GBS disease).

Intrapartum prophylaxis indicated

Patients meeting any of the following criteria should receive intrapartum prophylaxis:

- Previous infant with invasive GBS disease, OR
- GBS bacteriuria during current pregnancy, OR
- Positive GBS screening culture during pregnancy (unless a planned cesarean delivery, in the absence of labor or amniotic membrane rupture, is performed), OR
- Unknown GBS status (culture not done, incomplete, or result unknown) AND
- Delivery at < 37 wk gestation, ** OR
- Amniotic membrane rupture ≥ 18 hours, OR
- Intrapartum temperature ≥ 100.4 °F (≥ 38.0 °C) *

- If amnionitis is suspected, broad – spectrum antibiotic therapy that includes an agent known to be active against GBS should replace GBS prophylaxis.
- ** If onset of labor or rupture of amniotic membrane occurs at < 37 wk gestation AND there is a significant risk for preterm delivery (as assessed by the clinician), a suggested algorithm for GBS prophylaxis management is outlined below.

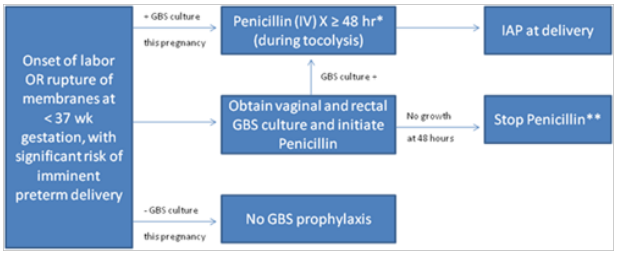
Intrapartum prophylaxis NOT indicated

If patient meets none of stated criteria, intrapartum prophylaxis for GBS is NOT indicated. This includes the following circumstances

a. Previous pregnancy with a positive GBS screening culture (unless a culture was ALSO positive during the current pregnancy)

b. Planned cesarean delivery performed in the absence of labor or membrane rupture (regardless of maternal GBS culture status)

c. Negative vaginal and rectal GBS screening culture during the current pregnancy, regardless of intrapartum risk factors.



* Penicillin should be continued for a total of at least 48 hours, unless delivery occurs sooner. For women who are GBS culture positive, antibiotic.

** If delivery has not occurred within 4 wk, a vaginal and rectal GBS screening culture should be repeated, and the patient should be managed as mention, based on the result of the repeat culture.

Clinical presentation

The initial diagnosis of sepsis is a clinical one & we should start treatment before results of culture are available. Clinical sign & symptoms are non specific and D.D is broad including RDS, metabolic diseases, Blood diseases, CNS diseases, Cardiac disease s& other infection eg. Torch.

Sign and symptoms include

i. Temp. irregularity: Low & high temp.

ii. Change in behavior: Lethargy, irritability & change in tone.

iii. Skin: Poor peripheral perfusion, cyanosis, mottling, pallor, petechiae, rashes & sclerema.

iv. Feeding Problems: Feeding intolerance, vomiting, diarrhea, & abdominal distention.

v. Cardiopulmonary: Tachypnea, R.D, apnea in 1st 24hrs or new onset esp. >1week, Tachycardia or hypotension (late sign).

vi. Metabolic: Hypo or hyperglycemia or metabolic acidosis.

Post delivery antibiotics

Target audience

Pediatrics, Obstetrics, GP and other related health care professionals.

Objectives

- To know the risk factors for neonatal sepsis.
- To know which baby needs work up and antibiotics.
- To know work up for neonatal septics.

Before prescribing antibiotics to the newborn we have to ask ourselves some questions

Are there any maternal risk factors for sepsis: This include: African Race, Malnutrition, Maternal GBS colonization, history of STD, Age < 20 years, low socioeconomic status, asymptomatic bacteraemia and previous history of GBS infection.

Are there intrapartum risk factors for sepsis: This include: Prom>18h, chorioamnionitis (fetal tachycardia, uterine tenderness, purulent amniotic fluid, unexplained maternal temp.>38) maternal fever, Perinatal asphyxia (AP at 5 min<6) DDL.

Are there neonatal risk factors for sepsis: This include: Male sex, twin birth, prematurity, LBW and Galactosemia.

When membranes ruptured: Prom>18h~ → high risk.

Fetal condition: Fetal tachycardia>160 also intrauterine monitoring for prolonged time

↑high risk of GBS infection.

Did the mother has cerclage for cervical incompetence: This ↑ high risk of sepsis

Are there any sign of sepsis: Signs of Neonatal Sepsis include Apnea, bradycardia, temp instability (high & low) Feeding intolerance, tachypnea jaundice, cyanosis, poor peripheral perfusion, hypo Glycemia, lethargy, poor sucking, high gastric aspirate and irritability. Also tachycardia, shock, vomiting, rash, abdominal distension, seizures and hepatomegaly.

Did the mother have epidural: It ↑ intrapartum fever and the needs for investigations and treatment but not risk of infection.

Did the mother tested for GBS and received antibiotics?: D.D We classify neonates for those with ↑ risk of sepsis and those with low risk of sepsis.

Differential diagnosis

Cardiac

- Congenital hypo plastic lateral heart syndrome, PPHN
- Acquired Myocarditis, shock.

GIT

- Neonatal Pupnea Fulminans
- ITP
- Immune mediated neutropenia
- Severe anemia
- Congenital Leukemia
- Hereditary clotting disorders

Metabolic

- ICH

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- HIE
- Neonatal seizures
- Infant Botulism

Respiratory

- RDS
- Aspiration Pneumonia
- TQF
- TTN

Database

a. Complete Maternal, Perinatal and Birth History. PE

b. The most important factors in neonates' sepsis are Affect, peripheral perfusion and respiratory status.

c. Lab

i. l.CBC

ii. Wbc values < 6000 or >30,000 in 1st 24 hours are abnormal. Band netrophils > 20 is abnormal. A normal Wbc can not rule out sepsis.

iii. A single Wbc count is not helpful and need to be repeated in 4-6 hour I/T Ratio (Immature to Total Neotrophils) has a good negative predictive value And if normal the likelihood of infection is minimal.

iv. 2.CRP Normal if <1

v. It has good negative predictive value if repeated over 1-3 days.

a. Blood Culture

i. Antibiotics removal device (ARD) bottles should be used of mother receiving antibiotics.

b. URINE ANALYSIS By suprapubic aspiration

c. LP Controversy

i. Maternal Lab Test

ii. Endocervical culture for GBS

iii. Endocervical culture for Chlamydia and gonorrhea -Urine Analysis and Culture -Other relevant lab value

d. Blood Glucose

e. ABG

f. AG Detection Assays: These include latex agglutination test for GBS, Counter immuno electrophoresis and bacteria Ag, all can done on serum, urine and csf

g. Gastric Aspiration Stain And Culture

- LAB TESTS are helpful in screening for neonatal sepsis but not done routinely because of availability are: Cytokinees ↑ TNF and ILG
- Fribinegen ↑ with infect.
- Fibronection low with infection (early marker)

CXR - Especially if Respiratory problem to rule out pneumonia.

Plan

Mostly we know which patient who needs sepsis work up and antibiotics but there are certain situations we will discuss it now.

Start antibiotics

- If symptomatic
- If chorioamniotis
- If risk factors and mother inadequately or not treated
- If GBS is positive at 36 weeks gestation and mother is inadequately or not treated.
- Inadequate treatment = < 2 doses of antibiotics
- Antibiotics given usually Ampicillin and Gentamycin till culture results are available.

When to discontinue antibiotics

- If cultures are negative and infants has signs of sepsis à Continue antibiotic for 10 days.
- If positive culture à treat accordingly.
- If negative culture and baby is doing well à stop antibiotic after 48-72 hours.
- A normal IT ratio and serial negative CRP have negative predictive value.

Summary

- If risk factor for neonatal sepsis and/or C/P
- Start antibiotics and work up
- Stop antibiotics
- If negative culture & baby is well
- If positive culture à treat all to C&S
- If negative culture but C/P of sepsis à10 days antibiotics.

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Conflicts of interest

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