GBS & Pregnancy

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Introduction

- GBS is the leading cause of early onset neonatal sepsis in developed countries.
- 15 - 25% of pregnant women are asymptomatic carriers of GBS.
- Less than 1/3 of neonates delivered vaginally are colonized.
- 1/200- 1/400 neonates will develop bacteremia and early onset GBS sepsis.
- This is important, because the contemporary case fatality rate for EOGBS is approximately 14%.

Colonization in Iranian pregnant women

Author	Year	City	% Colonization
S. Hadavand	2015	Tehran	3.3
E. Dastgedi	2014	Tehran	4.9
A. Hamedi	2012	Mashhad	6
N. Jahromi	2008	Shiraz	9.1
R. Darabi	2017	Yazd	11.8
F. Fatemi	2010	Tehran	20.6
F. Javanmanesh	2012	Tehran	22.76
S. Rabiee	2006	Hamedan	26.7

Risk Factors for GBS colonization in pregnancy

- Smoking
- History of vaginitis
- First pregnancy
- Premature ROM >18h
- GA < 37w
- Intrapartum temperature >38 C
- Chorioamnionitis
- Previous baby with invasive GBS infection
- GBS bacteriuria in the current pregnancy
- Positive culture during the 1st trimester
- Positive GBS history in previous pregnancies
- The number of defecations per day
- The number of times per day that genital hygiene is performed

Recurrence rate of GBS carriage in a subsequent pregnancy

38%

Cheng PJ, et al. Risk factors for recurrence of group B streptococcus colonization in a subsequent pregnancy. Obstet Gynecol 2008; 111(3):704-709

53%

Turrentine MA, Ramirez MM. Recurrence of group B streptococci colonization in subsequent pregnancy. Obstet Gynecol 2008; 112(2 Pt 1):259-264

41%

Tam T, Bilinski E, Lombard E. Recolonization of group B Streptococcus (GBS) in women with prior GBS genital colonization in pregnancy. J Matern Fetal Neonatal Med 2012; 25(10):1987-9

42%

Page-Ramsey SM, Johnstone SK, Kim D, Ramsey PS. Prevalence of group B Streptococcus colonization in subsequent pregnancies of group B Streptococcuscolonized versus noncolonized women. Am J Perinatol 2013; 30(5):383-388

50%

Colicchia et al. Recurrence of group B streptococcus colonization in subsequent pregnancies. J of Perinatol 2015; 35: 173–176

GBS Screening

- Screening for GBS has reduced the incidence of EOGBS disease by up to 80% in many countries.

- The risk factor approach is inconsistent and confusing and has not reduced the incidence of EOGBS disease.

- Pregnant women and their families should be offered the choice of screening for GBS.

GBS Screening

- The culture needs to be performed on selective enriched media in order to improve the sensitivity (screening vs active infection) .
- FNR of up to 50% can occur without the use of enriched culture media.
- Rectovaginal culture @36 weeks has a sensitivity of 91% and specificity of 88.9% for intrapartum maternal vaginal colonization.
- Culture results have been shown to be less predictive of carrier status if > 5w has elapsed between sample collection and delivery. (@ 35-37w)
- The NPV of GBS culture performed within 5w of delivery is 95-98%.
- GBS bacteriuria is commonly associated with heavy genital tract colonization. Women with this finding during pregnancy should receive appropriate Tx for bacteriuria, and IAP at the time of labor.

Presentation of GBS infection in pregnant women

- UTI
  (Asymptomatic bacteriuria, cystitis, PN)
- Intra amniotic infection, chorioamnionitis
- Pregnancy loss, preterm labor
- Endometritis
- Bacteremia
- Others
  [Meningitis (both antepartum and postpartum), endocarditis, abdominal abscess, and necrotizing fasciitis]

Specific Clinical Scenarios	Management
Elective CS	1) No additional prophylaxis is recommended, irrespective of GBS carriage. 2) GBS (+) & labor or spontaneous ROM before planned CS: IAP while awaiting delivery.
PTL & GBS (?)	Threatened PTL: Perform GBS culture. 1) IAP for GBS should be commenced if labor establishes and continued until delivery. 2) If labor does not establish, GBS prophylaxis should be ceased. 3) If the culture is subsequently GBS (+): IAP should be recommenced at the time of labor onset.
Term PROM	PROM & GBS (+): induction of labor and IAP without delay.
PPROM	Perform GBS culture, ACOG: IAP for 48h or until a GBS (-) , RCOG: no Tx If the GBS is (+): IAP with the onset of labor. Antibiotics for latency should be given independent consideration to GBS prophylaxis.
Clinical chorioamnionitis	GBS (+) & clinical signs of chorioamnionitis in labor: a broader spectrum of antibiotic cover will be required.

Antibiotic Regimen for Intrapartum Antibiotic Prophylaxis (IAP)

Antibiotic	Initial dose	Until delivery
Penicillin (preferred)	5 million unit iv	2.5-3.5 million unit iv q 4h
Ampicillin	2 g iv	1 g iv q 4h
Cefazolin (Penicillin allergic low risk)	2 g iv	1 g iv q 8h
Clindamycin (Penicillin allergic high risk)	900 mg iv	900 mg q 8h
Vancomycin (Clindamycin resistance or no available susceptibility test)	1 g iv or 15-20 mg/kg	1 g iv q 12h or 20 mg/kg q8h (maximum individual dose 2 g)

Timing and duration of prophylaxis (IAP)

- Antibiotics are given @ labor or ROM rather than at the time of a positive culture until delivery.
- IAP is most effective if administered at least 4h before delivery.
- The nadir in GBS colony counts in the amniotic and vaginal fluid is not reached until approximately 3h after the first antibiotic dose.

GBS **VACCINE ?**

- Development of GBS vaccines for maternal immunization has been identified as a priority by WHO.

- It has been estimated that such a vaccine could potentially prevent 231,000 infant and maternal GBS cases.

- Yet there is no vaccine in market.

Thank you

GBS in Neonate

Dr. Gholamreza Puladfar Infectious man - SUMS

Dr. Mehrdad Rezaei Neonatologist - SUMS

Introduction:

- In the absence of IAP,

  In mothers colonized with GBS

  50% of infants **colonized** at birth.

1% to 2% of all colonized infants develop **invasive GBS disease**

Clinical risk factors for GBS EOS:

- **GBS bacteriuria during pregnancy** is associated with heavy colonization of the rectovaginal tract and is considered a significant risk factor for EOS.

- **Black race**

- **maternal age <20 years** are associated with higher rates of GBS EOS, although it is not entirely clear whether this reflects only higher rates of GBS colonization in these populations.

Maternal factors predictive of GBS disease

- documented maternal **GBS colonization**,
- intrapartum **fever** (>38°C)
- other signs of **chorioamnionitis**,
- **prolonged rupture of membranes** (ROM) (>18 hours).

Neonatal risk factors:

- **prematurity** (<37 weeks‘ gestation)
- **low birth weight** (<2,500 g).

These factors are modified by the administration of intrapartum antibiotics.

Clinical presentation of EOS:

- **asymptomatic bacteremia,**
- **generalized sepsis,**
- **pneumonia,**
- **Meningitis.**

The clinical signs are usually apparent in the first hours of life; **>90% of infants are symptomatic by 24 hours of age.**

Clinical presentation of EOS:

- **Respiratory distress** is the most common presenting symptom.
  from mild **tachypnea** and **grunting**, with or without a supplemental oxygen requirement, to **respiratory failure**. Persistent pulmonary hypertension of the newborn (**PPHN**) can also accompany sepsis. Neonatal pneumonia (particularly that caused by GBS) can be accompanied by **primary or secondary surfactant deficiency.**
- **irritability**,
- **lethargy**,
- **temperature instability**,
- **poor perfusion**,
- **hypotension**.
- **DIC** with **purpura** and **petechiae** can occur in more severe septic shock.
- **Gastrointestinal symptoms** **poor feeding, vomiting, and ileus.**
- **Meningitis** may present with **seizure** activity, **apnea**, and **depressed sensorium** but may complicate sepsis without specific neurologic symptoms

Other diagnoses for the infant with signs of EOS:

- **RDS / TTN,**
- **meconium aspiration syndrome,**
- **intracranial hemorrhage,**
- **congenital viral disease, other bacterial sepsis**
- **congenital heart disease.**

infant presenting beyond the first few hours of life with a sepsis-like picture

- **bowel obstruction**,
- **necrotizing enterocolitis** (NEC),
- **inborn errors of metabolism**
- **ductal-dependent cardiac anomaly** (such as critical coarctation of the aorta or hypoplastic left heart syndrome) can mimic sepsis.

Group B streptococci: Lab diagnosis

Dr Gholamreza Pouladfar

Lab tests

1) Gram stain

2) The only method for diagnosing invasive GBS infection

   → Isolation of GBS from blood, CSF, and/or a site of local suppuration:

3) GBS antigen detection in blood, CSF, and/or urine

4) PCR