GBS antenatal Screening cultures Specimen collection

Pierrette Melin
National Reference Centre for GBS Medical Microbiology, University Hospital of Liege
**EOD: GBS VERTICAL TRANSMISSION**

**GBS colonized mothers**

- 60 - 40 %
- 40 - 60 %

**Risk factors**

- 2 - 4 %
- GBS EOD

**Non-colonized newborns**

**Colonized newborns**

96 - 98 %

Asymptomatic

- sepsis
- pneumonia
- meningitis
- long term sequelae

CDC

pm-chulg – 12.05.2009
GBS vertical transmission

- Vertical transmission of mother’s GBS
  - By contact and aspiration
    - In utero after rupture of membrane
    - In utero through intact membrane
    - By passage through birth canal
  - By hematogenous transmission
GBS vertical transmission

- 40-60% according to density of colonization
  - Higher probability of transmission
    - Higher GBS inoculum
    - Longer elapse time of rupture of membrane before delivery
    - Monitoring intra-uterine
    - Multifactorial

- Determination of transmission rate
  - By culturing muco-cutaneous swabs and gastric fluid at birth
    - Ombilic, ear canal, throat, …

Not predictive of EOD!
**Required RF for GBS EOD**

Vaginal (rectal) GBS colonization at delivery

- **GBS carriers**
  - GI tract = natural reservoir
  - 10 - 35% of women (vagina/rectum)
  - Clinical signs not predictive
    - Typically asymptomatic
  - Dynamic condition
    - Transient – chronic – intermittent
Prevention of perinatal GBS EOD

- Intrapartum antibiotics
  - Highly effective at preventing EOD in women at risk of transmitting GBS to their newborns (≥ 4 h)
  - « At risk » = GBS colonized at « time of delivery » with/without other RF

INTRAPARTUM ANTIMICROBIAL PROPHYLAXIS

Main goal:
- To prevent 70 to 80 % of GBS EO cases

Secondary:
- To reduce peripartum maternal morbidity
Prevention of Perinatal Group B Streptococcal Disease
Revised Guidelines from CDC

CDC, USA, MMWR, Vol 51 (RR-11) August 2002
Endorsed by AAP and by ACOG in 2002

CSS, Belgium July 2003

Prevention des infections périnatales à streptocoques du groupe B
How could you know if my mom is GBS-colonized?
Prenatal GBS culture Screening

- Critical factors influencing accuracy
  - Timing of sampling
  - Swabbed anatomic sites
  - Screening methods
    - Culture media
Determination of GBS colonized status at time of delivery

- Culture at time of delivery
  - Results after 18 – 48 hours
  - Not useful

- Prenatal cultures at 26-28 weeks gestation
  - As in the first guidelines (AAP) in the 1990s

- Prenatal cultures late in pregnancy
  - More or less reliable and accurate
    - Critical factors
  - Not standard procedure for vaginal culture
    - To specify on analysis request form
Optimal time for screening
35-37 weeks gestation

Culture-based screening done 1 to 5 or $\geq 6$ weeks before delivery (Yancey, 860 cases; Melin, 531 cases)

Melin et al. ICAAC 2000
Optimal time for screening
35-37 weeks gestation

Culture-based screening done 1 to 5 or $\geq$ 6 weeks before delivery (Yancey, 860 cases; Melin, 531 cases)

Melin, 13-16% GBS Pos
PPV= 56%
NPV= 95%
or 5% False negative
or 30% of GBS pos in labor not detected with prenatal screening!

Melin et al. ICAAC 2000
Choice of the anatomic sites

Vagina + rectum

Vagina & rectum > vagina or rectum > cervix

Badri et al., J Infect Dis 1977;135:308-12

- Rectum (swab inserted through anal sphincter)
  - = reservoir, source of vaginal colonization
- Rectum GBS positive and vagina negative
  - 15 to 20% of GBS positive pregnant women
- Lower vaginal area
  - To exclude use of speculum for collection
## Crucial conditions to optimize SCREENING

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WHEN</strong></td>
<td>35-37 weeks</td>
</tr>
<tr>
<td><strong>WHO</strong></td>
<td>ALL the pregnant women</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
<td>Vaginal + rectal swab(s)</td>
</tr>
<tr>
<td><strong>Collection</strong></td>
<td>WITHOUT speculum</td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td>Transport/collection device</td>
</tr>
<tr>
<td></td>
<td>(non nutritive medium: Amies/Stuart)</td>
</tr>
<tr>
<td><strong>Request form</strong></td>
<td>To specify prenatal « GBS » screening + expected address for delivery</td>
</tr>
</tbody>
</table>

*(CDC 2002 - Belgian SHC 2003 - Spanish guidelines)*
Screening-based strategy for prevention of GBS perinatal disease *(Belgian SCH, 2003)*

Recto-vaginal GBS screening culture at 35-37 weeks of gestation

For ALL pregnant women

**GBS Neg**

- Not done, incomplete or unknown GBS result

**GBS POS**

- ! Facultative! Intrapartum rapid GBS test**

- > 1 Risk factor:
  - Intrapartum fever > 38°C***
  - ROM > 18 hrs

Intrapartum prophylaxis NOT indicated

Unless patient had a previous infant with GBS invasive disease or GBS bacteriuria during current pregnancy or delivery occurs < 37 weeks’ gestation *
Intrapartum antimicrobial prophylaxis-IAP
Universal prenatal screening at 35-37 weeks gestation

Risk-based approach reserved for women with unknown GBS status at time of labor.
Adhesion to a common protocol is a key of success
Multidisciplinary collaboration is mandatory
Culture-based GBS prenatal screening
To optimize critical factors

- Specimen collection
  - 35-37 weeks gestation
  - Vagina + rectal swab(s)

- Specimen transport and storage
- Specimen processing