INVASIVE GROUP B STREP

Also known as *Streptococcus agalactiae*

✓DISEASE AND EPIDEMIOLOGY

Clinical Description:

GBS is a major cause of perinatal bacterial infections in both pregnant women and infants. In addition, adults with underlying medical conditions are more susceptible to systemic GBS infections. Invasive GBS disease in newborns is characterized by two distinct presentations, depending on the infant's age at onset.

Early Onset Disease:

Early onset disease occurs 1–6 days following delivery, most frequently within the first 24 hours of life. The most common signs of early onset systemic infection are respiratory distress, apnea, and shock. With early onset disease, invasive GBS infection typically manifests as sepsis, pneumonia, and occasionally, meningitis.

Late Onset Disease:

Late onset disease can occur from 1 week to several months (typically 3–4 weeks) following delivery. With late onset disease, invasive GBS infection usually manifests as sepsis or meningitis.

In pregnant women, GBS can cause urinary tract infections, womb infections (endometritis and chorioamnionitis), bacteremia, and stillbirth. Among men and non-pregnant women, the most common diseases caused by GBS include sepsis, pneumonia, endocarditis, and cellulitis.

Causative Agent:

Group B streptococcal (GBS) disease is caused by the aerobic bacterium *Streptococcus agalactiae.* There are nine serologically distinct serotypes of *S. agalactiae.*

Differential Diagnosis:

Early onset disease must be differentiated from *Listeria monocytogenes*, *E. coli*, or other meningitis due to enterobacteriaceae.

Laboratory identification:

Diagnostic testing: The usual method of identification is through blood or CSF culture. These cultures are routinely available in most clinical laboratories.

UPHL: UPHL can provide confirmation for isolates submitted via clinical laboratories.

Prenatal screening: Labs should use a sensitive method for prenatal screening in order to assure that colonized women are not missed. Clinicians should swab both the lower vagina and rectum, and place swabs into nonnutrient transport

medium. Labs should inoculate the swabs into a selective enrichment broth for overnight incubation, and then subculture the broth onto sheep blood agar.

UPHL: UPHL does not provide prenatal screening services.

Treatment:

- Appropriate antibiotics include penicillin, gentamicin, and/or vancomycin.
- Women who are allergic to penicillin should receive cefazolin due to the increasing resistance of GBS to erythromycin and clindamycin.
- Colonized women should NOT be treated with oral antimicrobial agents as they are not effective in eliminating GBS carriage or preventing invasive disease.
- Pregnant women with GBS bacteriuria SHOULD be treated prior to delivery.

Case fatality:

The case-fatality rate for invasive GBS is typically 5–8%, but it is higher in pre-term infants.

Reservoir:

Humans are the only known host for GBS.

Susceptibility:

Everyone is susceptible to GBS. Pregnant women, newborns, people with diabetes mellitus, chronic renal disease, chronic liver disease, malignancy, and other immunocompromising conditions, as well as those over the age of 65 are more susceptible to invasive disease.

Risk is higher in preterm infants born at less than 37 weeks gestation, in infants born after the amniotic membranes have been ruptured 18 hours or more, and in infants born to women with high genital GBS colonization, intrapartum fever, chorioamnionitis, or GBS bacteriuria during the pregnancy, maternal age younger than 20 years, and African-American race or Hispanic ethnicity.

Transmission:

Transmission from mother to infant occurs just before or during delivery. After delivery, infants are occasionally infected via person-to-person transmission in the nursery. In adults, GBS can be acquired through person-to-person transmission from healthy carriers (colonized but asymptomatic) in the community.

Incubation period:

The incubation period for early onset GBS disease is <7 days. The incubation period for late onset GBS disease in infants and in adults is unknown.

Period of communicability:

The period of communicability for GBS is unknown, but it presumably lasts for the duration of colonization or disease.

Epidemiology:

In adults, colonization is common in the genitourinary and gastrointestinal tracts, and occasionally, the pharynx. Approximately 15–40% of pregnant women are GBS carriers (colonization can be constant or intermittent). Prior to the current recommendations for maternal peripartum (around the time of delivery or membrane rupture) antimicrobial prophylaxis for prevention of early onset GBS disease in neonates, the incidence of early onset GBS disease in newborns was 1–4 cases per 1000 live births. Early onset disease accounted for approximately 75% of infant GBS cases and occurred in approximately one infant per 100–200 colonized women. Due to the widespread use of maternal intrapartum antimicrobial prophylaxis, the incidence rate of early onset GBS disease has decreased about 70% to approximately 0.5 cases per 1000 live births.

The most recent guidelines (2002) for intrapartum screening and antimicrobial prophylaxis are available on the Centers for Disease Control and Prevention (CDC) website at www.cdc.gov/mmwr/preview/mmwrhtml/rr5111a1.htm

✓PUBLIC HEALTH CONTROL MEASURES

Public health responsibility:

- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identify clusters or outbreaks of this disease.
- Identify potential infections that may be traced to carriers involved in direct patient care.
- Identify situations where the rate of early or late onset disease is higher than the national average.

Prevention and Chemoprophylaxis:

Current recommendations for the prevention of perinatal GBS disease include:

- Screening all pregnant women at 35–37 weeks of gestation by vaginal-rectal culture, and
- Providing those colonized with GBS with antimicrobial prophylaxis at the time of labor or of membrane rupture.
- Women whose culture results are unknown at the time of delivery should be provided antimicrobial prophylaxis if any of the following risk factors are present:
    - Delivery at <37 weeks of gestation,
    - Maternal fever of >38.0°C (>100.4°F),
    - Duration of membrane rupture of 18 hours or longer.
- The following women do not need to be screened and should always receive prophylaxis during delivery:
    - Those with GBS bacteriuria during the current pregnancy or
    - Those who have previously had an infant with invasive GBS disease.

- Women with a planned cesarean delivery that occurs prior to rupture of membranes should NOT receive intrapartum chemoprophylaxis routinely.
- Routine chemoprophylaxis for neonates born to mothers who have received adequate intrapartum chemoprophylaxis for GBS disease is NOT recommended unless the infant has clinically-suspected systemic infection.

Vaccine:
None.

Isolation and quarantine requirements:
Isolation: None
Hospital: Standard body substance precautions unless there is a demonstrated outbreak in a nursery.
Quarantine: None

✓CASE INVESTIGATION

Reporting:
Group B strep (S. agalactiae) is reportable from all normally-sterile sites such as blood, CSF, joint or body fluids, and tissue and bone (including the endometrium).

Case definition:
CSTE/CDC does not have a formal case definition. In Utah, we will use the following case definitions:

Confirmed:
Isolation of GBS from any normally sterile body site (e.g., blood, CSF, joint fluid, tissue and bone, or any normally-sterile body fluid).

Confirmed, early-onset disease:
A confirmed case that occurs in any child under 7 days of age.

Confirmed, late-onset disease:
A confirmed case that occurs in any child over 6 days of age and under 91 days of age.

Case Investigation Process:

Outbreaks:
Situations where the rate of early or late onset disease exceeds the national rate from active surveillance sites, or situations where more than 1 case of GBS invasive disease is identified in a long term care facility in a 60 day period.

Identification of case contacts:
None

Case contact management:

None

✓REFERENCES

American Academy of Pediatrics: Severe Invasive Group A Streptococcal Infections: A Subject Review; Pediatrics 101 (1), 136, 1998.

Active Bacterial Core Surveillance Report, Emerging Infections Program Network, Centers for Disease Control, 2005.

Centers for Disease Control, Case Definitions for Infectious Conditions Under Public Health Surveillance. MMWR 46 (RR-10), 1997.l

Control of Communicable Diseases Manual (18th Edition), Heymann, D.L., Ed; 2004.

Red Book: 2003 Report of the Committee on Infectious Diseases (26th Edition), Larry K. Pickering MD, Ed; 2003.

Principles and Practice of Infectious Disease (6th Edition), Gerald L. Mandell, John E. Bennett, and Raphael Dolin Eds; 2005.

Massachusetts Department of Public Health, Guide to Surveillance, Reporting and Control, 2006.

Centers for Disease Control and Prevention. Prevention of Perinatal Group B Streptococcal Disease Revised Guidelines from CDC. *MMWR.* August 16, 2002; 51(RR-11): 1–22.