Prevention and Management of Infants With Suspected or Proven Neonatal Sepsis

In 2010, the Centers for Disease Control and Prevention in collaboration with the American Academy of Family Physicians, American Academy of Pediatrics (AAP), American College of Nurse-Midwives, American College of Obstetricians and Gynecologists, and American Society for Microbiology published revised group B streptococcal (GBS) guidelines entitled “Prevention of perinatal group B streptococcal disease: revised guidelines from CDC 2010” in the Morbidity and Mortality Weekly Report (MMWR). The recommendations were endorsed by all the collaborating organizations including AAP after review by the Committee on Infectious Diseases (COID) and the Committee on Fetus and Newborn (COFN) and after AAP Board approval. In the report, a revised algorithm for “Secondary prevention of early-onset group B streptococcal disease” was included. This algorithm represented the expert opinions of the technical working group (based on current literature available at that time). In 2011, the COID and the COFN published a policy statement in Pediatrics that was in agreement with the 2010 GBS guidelines and included the same algorithm.2 In the spring of 2012, the COFN published a clinical report containing management guidelines entitled “Management of neonates with suspected or proven early-onset neonatal sepsis.”3 The 2012 COFN document includes guidance on laboratory evaluations and treatment duration, which were not addressed in the 2010 GBS prevention guidelines. The algorithms at the end of the COFN report differed from those in the 2010 guidelines published in the MMWR.1 The discordance in the algorithms prompted questions by the pediatric community as to which recommendations to follow.

The purpose of this commentary is to clarify AAP policy. Discordant algorithms for secondary prevention of GBS were published in 2 separate policy statements.2,3 This commentary includes the algorithm that has been approved as current AAP policy. Providing a single algorithm will avoid confusion and ensure that the guidelines achieve their desired effects.

The COFN and the COID strongly support the recommendations made in the 2010 prevention guidelines approved by the AAP and the other collaborating organizations (secondary prevention of GBS algorithm representing current AAP policy is attached in Fig 1). However, the COFN notes that in some situations, other approaches might be considered that differ from guidance provided in the 2010 prevention guidelines. The following recommendations include the recommendations from the 2010 MMWR publication and those made by the COFN:

1. Neonates who have signs of sepsis should receive broad-spectrum antimicrobial agents.
2. Healthy-appearing preterm and term infants born to women with suspected chorioamnionitis should receive a blood culture at
birth, a complete blood count with differential +/- C-reactive protein at age 6 to 12 hours. These infants should be treated with broad-spectrum antimicrobial agents.

3. For well-appearing infants \(\geq 37\) weeks gestation whose mother did not have suspected chorioamnionitis, but who did have an indication for intrapartum antibiotic prophylaxis and did not receive at least 4 hours of intrapartum penicillin, ampicillin or cefazolin:

a. The 2010 GBS prevention guidelines and the 2012 COFN statement agree that infants who are well appearing can be observed without additional testing if duration of rupture of membranes is \(< 18\) hours. The COFN believes that infants at 35 to 36 weeks gestation can be treated similarly if the physical examination is normal.

b. If duration of membrane rupture is \(\geq 18\) hours and IAP is inadequate, the 2010 GBS prevention guidelines recommend a limited evaluation (blood culture and complete blood cell (CBC) count with differential at birth or 6 to 12 hours of age) and hospital observation for 48 hours. The COFN recommends hospital observation for 48 hours in this circumstance (without further testing or cultures). However, when close observation is not possible, the COFN recommends a laboratory evaluation.

4. For well-appearing infants \(< 37\) weeks gestation whose mother did not have suspected chorioamnionitis, but who did have an indication for IAP and did not receive adequate prophylaxis, the 2010 GBS prevention guidelines recommend a limited evaluation (blood culture and CBC count) and hospital observation for 48 hours. The COFN also recommends a limited evaluation, but no blood culture unless antibiotics are started because of abnormal laboratory data.

5. The 2010 GBS prevention guidelines do not address the duration of antibiotic therapy. The COFN makes recommendations for the duration of antimicrobial therapy based on the results of laboratory testing. Healthy-appearing infants without evidence of bacterial infection should receive broad-spectrum antimicrobial agents for no more than 48 hours. In small preterm infants, some may continue antibiotics for up to 72 hours while awaiting bacterial culture results.

Published data to support recommendations for prevention and management of newborn sepsis are limited. However, success of the GBS prevention guidelines provides evidence that reductions in early-onset GBS disease have been possible by the development of consensus guidelines with consistent

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**FIGURE 1**
Secondary prevention of GBS disease.\(^1\) Algorithm for the prevention of early-onset GBS infection in the newborn. (Adapted with permission from Centers for Disease Control and Prevention. Prevention of perinatal group B streptococcal disease: prevention of perinatal group B streptococcal disease from CDC, 2010. MMWR Recomm Rep. 2010;59 [RR-10]:1–32.) IV, intravenously. \(^2\)Full diagnostic evaluation includes a blood culture, CBC count, including white blood cell differential and platelet counts, chest radiograph (if respiratory abnormalities are present); and lumbar puncture (if the patient is stable enough to tolerate procedure and sepsis is suspected). \(^3\)Antibiotic therapy should be directed toward the most common causes of neonatal sepsis, including intravenous ampicillin for GBS and coverage for other organisms (including Escherichia coli and other gram-negative pathogens) and should take into account local antibiotic-resistance patterns. \(^4\)Consultation with obstetric providers is important in determining the level of clinical suspicion for chorioamnionitis. Chorioamnionitis is diagnosed clinically, and some of the signs are nonspecific. \(^5\)Limited evaluation includes blood culture (at birth) and CBC count with differential and platelets (at birth and/or at 6–12 hours after birth). \(^6\)GBS prophylaxis is indicated if 1 or more of the following is true: (1) mother is GBS-positive late in gestation and is not undergoing cesarean delivery before labor onset with intact amniotic membranes; (2) GBS status is unknown and there are 1 or more intrapartum risk factors, including \(<37\) weeks gestation, rupture of membranes for \(18\) hours, or temperature of \(\geq 100.4\)\(^\circ\)C; (3) GBS bacteriuria during current pregnancy; or (4) history of a previous infant with GBS disease. \(^7\)If signs of sepsis develop, a full diagnostic evaluation should be performed, and antibiotic therapy should be initiated. \(^8\)If \(\geq 37\) weeks gestation, observation may occur at home after 24 hours if other discharge criteria have been met, there is ready access to medical care, and a person who is able to comply fully with instructions for home observation will be present. If any of these conditions is not met, the infant should be observed in the hospital for at least 48 hours and until discharge criteria have been achieved. \(^9\)Some experts recommend a CBC count with differential and platelets at 6 to 12 hours of age.
The COFN’s 2012 recommendations complement the 2010 GBS prevention guidelines by providing additional treatment information that is not addressed in the 2010 prevention guidelines. These should provide clinicians with guidance for optimal duration of antimicrobial therapy and reduce excess exposure to broad-spectrum antimicrobial therapy in healthy-appearing uninfected infants who had empirical antimicrobial therapy initiated.

REFERENCES


CANINE LICKS OF LOVE SHAPE HUMAN BIOME: There’s nothing like coming home at the end of the day to find man’s best friend there to greet you. Dogs provide unconditional love and affection, and it appears that their welcoming kisses may do more than just strengthen the relationship between human and animal. As reported on an NPR health news blog (Shots: April 18, 2013), a recent study indicates that dog owners share a common bond—the bacteria on their skin. In their investigation of 159 individuals living in 17 households, researchers found that dog owners living in separate households share a common bacterial linkage through their canine companions. Actinobacteria and Betaproteobacteria found in soil and on dogs’ tongues, respectively, were present on dog owners’ skin in greater amounts than in those who did not own dogs. Unsurprisingly, the type and amount of bacteria on an owner’s skin were most closely related to that of their own pooch. This effect was only observed in the adult dog owner population (18-59 years of age); the presence of other household pets, including cats, had no significant effect on owner microbiota. While our canine furry friends may shape our skin environment, additional research is necessary to better define how these bacteria influence our health.

Noted by Leah H. Carr, BS, MS-IV
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Michael T. Brady and Richard A. Polin

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