



Antimicrobial Susceptibilities Among Group B *Streptococcus* Isolates Active Bacterial Core Surveillance (ABCs), 2010



Introduction

Group B *Streptococcus* (GBS) is the leading infectious cause of neonatal morbidity and mortality in the United States. GBS disease is also an important pathogen in the elderly and in persons with compromised immune systems. As a result of prevention efforts, primarily the administration of intrapartum antibiotics to women at-risk for transmitting GBS to their newborns, the incidence of neonatal GBS disease has declined in recent years [1]. Emergence of antimicrobial resistance, particularly to the first line beta-lactam agents, could threaten the success of this strategy [2]. Resistance among GBS isolates to clindamycin has already complicated guidance for GBS-colonized, penicillin-allergic women [3, 4]. Surveillance for antimicrobial resistance among GBS isolates is important to informing antibiotic regimens for prevention of neonatal GBS disease and for empiric treatment in all age groups.

For this report, GBS isolates collected from ABCs cases in 2010 were analyzed to understand antimicrobial susceptibility patterns.

Methods

GBS disease was defined as isolation of GBS from a normally sterile site (e.g. blood, cerebrospinal fluid, or joint fluid) from a resident of ABCs surveillance areas. Early-onset GBS cases occur at <7 days of age and late-onset occur between 7 and 89 days of age. GBS isolates were collected from all ABCs cases, except for cases in the states of California, Connecticut, Tennessee, and cases occurring in persons >1 year old in Colorado. Of the 1429 isolates available for testing, antimicrobial resistance testing was performed on 1427 (>99%).

Antimicrobial resistance testing on isolates from cases residing in Minnesota was performed at the Minnesota Department of Health Public Health Laboratory. For all other isolates, testing was performed at the Streptococcal Reference Laboratory at CDC. Testing was performed using broth microdilution in microtiter plates using cation-adjusted Muller-Hinton broth with 3% lysed horse blood (TREK Diagnostic Systems, Cleveland, OH). 2010 Clinical Laboratory and Standards Institute (CLSI) susceptibility definitions were used when available [5].

Results

Table 1. Antibiotic Susceptibilities of GBS Isolates—ABCs, 2010. (n=1427)

Antibiotic	Susceptible	Intermediate	Resistant
Penicillin	1427 (100%)	0	0
Clindamycin	1018 (71%)*	13 (0.9%)	396 (28%)
Erythromycin	724 (51%)	7 (0.5%)	696 (49%)
Vancomycin	1427 (100%)	0	0
Cefotaxime	1427 (100%)	0	0

†Based on 2010 CLSI susceptibility definitions.

*ABCs does not test for inducible clindamycin resistance routinely, but clinical laboratories should test GBS isolates from penicillin-allergic patients for clindamycin resistance.

Table 2. Minimum Inhibitory Concentrations of GBS Isolates to Cefazolin – ABCs, 2010. (n=1427)

Minimum Inhibitory Concentration (µg/mL)	Number of Isolates
0.06	1
0.12	33
0.25	1322
0.50	71
≥1	0

Note: Per CLSI, all isolates are considered susceptible to Cefazolin, regardless of the minimum inhibitory concentration, because all isolates are susceptible to penicillin.

Table 3. Antibiotic Susceptibilities of GBS Isolates from Cases of Early-Onset Disease—ABCs, 2010. (n=92)

Antibiotic	Susceptible	Resistant
Penicillin	92 (100%)	0
Clindamycin	67 (73%)*	24 (27%)
Erythromycin	48 (52%)	44 (48%)
Vancomycin	92 (100%)	0
Cefotaxime	92 (100%)	0

†Based on 2010 CLSI susceptibility definitions.

*ABCs does not test for inducible clindamycin resistance routinely, but clinical laboratories should test GBS isolates from penicillin-allergic patients for clindamycin resistance.

Table 4. Antibiotic Susceptibilities of GBS Isolates from Cases of Late-Onset Disease—ABCs, 2010. (n=79)

Antibiotic	Susceptible	Intermediate	Resistant
Penicillin	79 (100%)	0	0
Clindamycin	64 (81%)*	2 (3%)	13 (16%)
Erythromycin	38 (48%)	0	41 (52%)
Vancomycin	79 (100%)	0	0
Cefotaxime	79 (100%)	0	0

†Based on 2010 CLSI susceptibility definitions.

*ABCs does not test for inducible clindamycin resistance routinely, but clinical laboratories should test GBS isolates from penicillin-allergic patients for clindamycin resistance.

Table 5. Antibiotic Susceptibilities of GBS Isolates from cases in adults ≥65 years—ABCs, 2010. (n=513)

Antibiotic	Susceptible	Intermediate	Resistant
Penicillin	513(100%)	0	0
Clindamycin	376 (73%)*	5 (1 %)	132 (26%)
Erythromycin	279 (54%)	2 (0.4%)	232 (45%)
Vancomycin	513 (100%)	0	0
Cefotaxime	513 (100%)	0	0

†Based on 2010 CLSI susceptibility definitions.

*ABCs does not test for inducible clindamycin resistance routinely, but clinical laboratories should test GBS isolates from penicillin-allergic patients for clindamycin resistance.

Conclusions

Based on 2010 CLSI susceptibility definitions, all GBS isolates were susceptible to penicillin and ampicillin, the recommended first-line agents for intrapartum antibiotic prophylaxis [5]. All isolates were also susceptible to cefazolin, which is the recommended antibiotic for IAP in penicillin-allergic women who do not have a history of anaphylaxis, angioedema, respiratory distress, or urticaria following administration of a penicillin or cephalosporin [1]. More than 25% of isolates were resistant to clindamycin and almost 50% of isolates were resistant to erythromycin. These findings support current recommendations for antimicrobial susceptibility testing of GBS isolates obtained from penicillin-allergic women at high risk for anaphylaxis to penicillin to direct the choice of IAP agent. Penicillin-allergic women at high risk for anaphylaxis to penicillin should receive clindamycin in the following clinical situations:

1. A woman is colonized with a GBS isolate that is susceptible to both clindamycin and erythromycin

OR

2. A woman is colonized with a GBS isolate that is sensitive to clindamycin and resistant to erythromycin AND testing for inducible clindamycin resistance is negative.

Erythromycin is no longer recommended for penicillin-allergic women at high risk for anaphylaxis [1].

All GBS isolates were susceptible to vancomycin based on 2010 CLSI susceptibility definitions. Vancomycin is recommended only for penicillin-allergic women at high risk for anaphylaxis if their GBS isolate is resistant to clindamycin, displays inducible resistance to clindamycin, or results from antimicrobial susceptibility testing are unknown. Because of the continued widespread use of antibiotic prophylaxis to prevent early-onset GBS disease, surveillance for antimicrobial resistance to common antibiotics remains important for informing both prevention and empiric treatment regimens.

References

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Citation

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