Group B Streptococcus Surveillance Report 2015

Oregon Active Bacterial Core Surveillance (ABCs)

Center for Public Health Practice

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Background

The Active Bacterial Core surveillance (ABCs) program is a core component of the Emerging Infections Program (EIP) Network sponsored by the Centers for Disease Control and Prevention (CDC). The purpose of the ABCs program is to determine the incidence and epidemiologic characteristics of invasive disease due to *Haemophilus influenzae*, *Neisseria meningitidis*, group A streptococcus (GAS), group B streptococcus (GBS), and *Streptococcus pneumoniae*. The entire EIP Network for invasive GBS represents almost 33 million persons in 10 surveillance areas around the United States. More information on the EIP/ABCs Network is found at: http://www.cdc.gov/abcs/index.html.

In Oregon, the surveillance area for invasive GBS (*Streptococcus agalactiae*) disease comprises the tri-county (Clackamas, Multnomah, and Washington) Portland metropolitan area, with a 2015 estimated population of 1,745,385.* More information on the Oregon ABCs program is found at: http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/EmergingInfections/Pages/ActiveBacterialCoreSurveillance.aspx.

Methods

Invasive GBS disease (IGBS) is defined as the isolation of GBS from a normally sterile body site in a tri-county resident. Cases are reported via Electronic Laboratory Reporting (ELR). Additional cases are identified through regular laboratory record reviews. Tri-county hospital laboratories submit GBS isolates to the Oregon State Public Health Laboratory, which forwards them to CDC for serotyping and susceptibility testing. Health record reviews of each case allow standardized reports of demographic characteristics, clinical syndrome manifestations, underlying illnesses or conditions, and illness outcome.

Surveillance Results

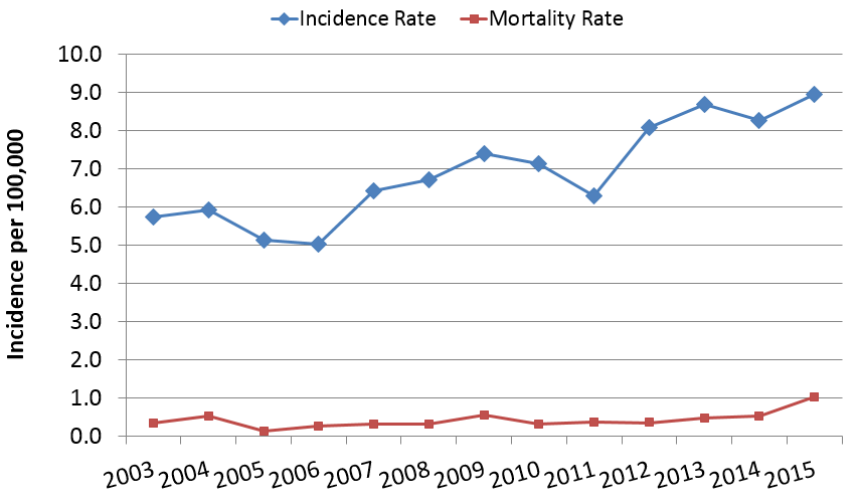
Descriptive Epidemiology

In 2015, 156 cases of invasive GBS disease were reported in the tri-county Portland area, corresponding to an incidence rate of 8.9/100,000 persons (Figure 1). This is 16% higher than the average annual incidence rate in the Portland area from 2010-2014 (7.7/100,000) and 1.5 percent higher than the most recent national projection of invasive disease (8.8/100,000).[1] Of these cases, there were eighteen deaths, for an annual mortality rate due to invasive GBS disease of 1/100,000 (Figure 1). This rate is 154% higher than the figure reported from 2010-2014 in the Portland area (0.41/100,000) and 98% higher than the most recent national projections (0.52/100,000).[1]
The 2015 case fatality rate for invasive GBS disease in the Portland area was 11 percent. This is 119% higher than the rates in the Portland area from 2010-2014 (5%) and 92% higher than entire ABCs network in 2014 (6%).[1]

* Source: Portland State University Population Research Center (http://www.pdx.edu/prc/)

Fifty-six percent of cases were male; of 144 cases where race was known, 86 percent were white, 3 percent were Asian/Pacific Islander, 8 percent were black, 2 percent were American Indian/ Alaska Native, and 1 percent was multiracial; and of 147 cases where ethnicity was known, 5 percent were Hispanic or Latino.

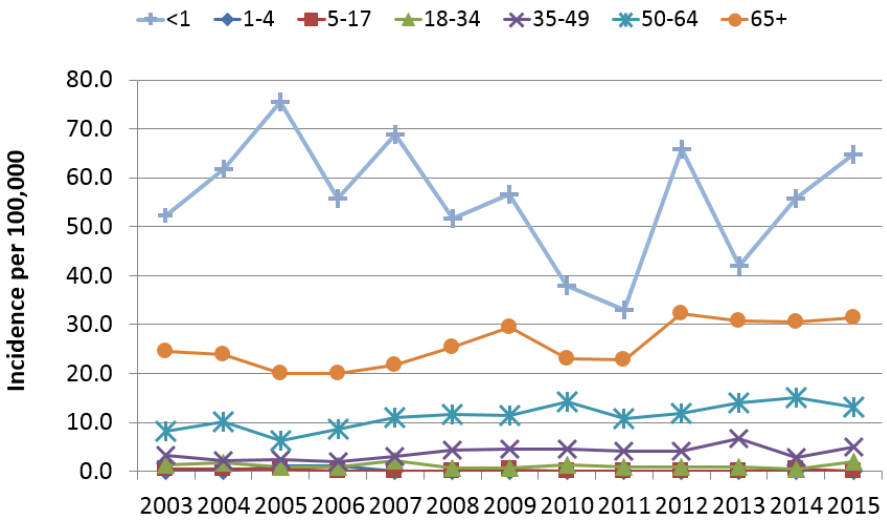
Figure 1: Incidence and Mortality Rates of IGBS Cases in Tri-county Area



The incidence rate of invasive GBS disease in Multnomah County in 2014 (10/100,000) was higher than those reported from Clackamas (8.3) and Washington (7.4/100,000) counties. The rates in Washington County was higher than their respective 2010-2014 averages (5.3/100,000), while the rates in Multnomah and Clackamas counties remained stable. In 2015, nine deaths due to GBS occurred in Multnomah County (1.1/100,000); five deaths in Washington County (0.88/100,000); and four deaths in Clackamas County (1.0/100,000).

In 2015, the burden of disease due to invasive GBS disease was highest in those <1 year of age (14 cases; incidence 64.7/100,000) (Figure 2). Incidence was also high among those ≥65 years of age (72 cases; incidence 31.3/100,000) and among those between the ages of 50 and 64 (43 cases; incidence 13.1/100,000).

Figure 2: Incidence of IGBS Cases in Tri-county Area by Age

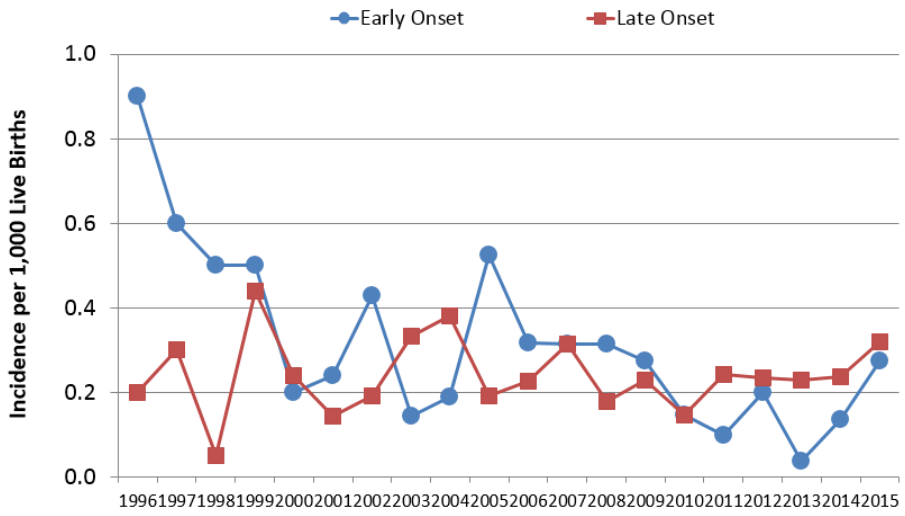


Among the 18 deaths reported, the burden of deaths due to invasive GBS disease was highest in those <1 year of age (3 deaths; mortality 13.9/100,000). Seven deaths were reported among those ≥65 years of age (mortality 3.0/100,000). Eight deaths were reported among the 50-64 age group (mortality 2.4/100,000). For cases reported since 2003, fatal outcome from IGBS has been associated with age (p=0.01).

Among infants, there are two main types of GBS disease. Early-onset disease is defined as invasive GBS disease occurring in infants less than seven days of age; late-onset disease is defined as invasive GBS disease occurring in infants from 7 to 89 days of age.

After a 78 percent decrease from 1996-2000, the incidence of early-onset GBS disease has stayed largely stable, outside of annual fluctuations (Figure 3). The incidence of late-onset disease has been relatively stable throughout the surveillance period. However, in 2015, the incidence of early-onset disease – six cases; 0.27 per 1,000 live births – was 121 percent higher than the previous five-year average (0..12/1,000), and 46 percent higher than the national estimate of disease (0.28/1,000).[1] The 2015 rate of late-onset disease – seven cases; 0.32 per 1,000 live births – was 46 percent higher than the previous five-year average (0.22/1,000) and 14 percent higher than the national estimate (0.28/1,000).[1]

Figure 3: Incidence of Early- and Late-Onset IGBS Disease



Clinical Manifestations

The clinical manifestations of invasive GBS disease are listed in Table 1. Pneumonia was less commonly seen in cases in 2015 than compared to the previous five years (p=0.03). The remainder of the clinical manifestation profile of invasive GBS disease in 2015 was not statistically significantly different than that seen from cases reported during the previous five years.

Table 1: Percent of IGBS Cases† Reporting Common Clinical Syndromes

Syndrome	2015 (n=156)	2010-2014 (n=643)
Primary bacteremia	47	42
Cellulitis	26	23
Pneumonia	5	9
Meningitis	3	4
Other††	21	22

† Some cases report more than 1 syndrome.
†† Other syndrome includes abscess (not skin), endometritis, endocarditis, HUS (hemolytic uremic syndrome), osteomyelitis, pericarditis, peritonitis, septic arthritis, septic shock.

For cases reported since 2006, pneumonia and cellulitis were more common with increasing age (p<0.0001 and p<0.0001, respectively), while meningitis was less common (p<0.0001). After adjusting for age, a fatal outcome was 2.4 times more likely among those presenting with pneumonia (95% confidence interval [CI] 1.1, 5.2). Among the six infants with early-onset GBS disease reported

in 2015, the predominant clinical syndrome present was bacteremia. Among seven late-onset cases, five presented with bacteremia and two with meningitis.

Underlying Conditions

Ninety-four percent of adults with IGBS reported at least one underlying condition or behavioral risk factor for GBS disease. Adults aged 18-64 years were more likely to report alcohol abuse, smoking, or no underlying conditions compared to adults over 65 years, while cardiovascular disease, diabetes, and chronic obstructive pulmonary disease (COPD) were significantly associated with cases among older adults (Table 2). Alcohol abuse was significantly associated with fatal outcome among adults (p=0.0028 after adjusting for age.

Table 2: Distribution of Underlying Conditions by Age Reported Among Adult IGBS Cases, 2006-2015

Underlying Condition	18-64 (n=197) N (%)	65+ (n=891) N (%)	Total (n=1088) N (%)	p-value
Alcohol Abuse	10 (5)	19 (2)	29 (3)	0.0203
Cancer	10 (5)	57 (6)	67 (6)	0.4851
Cardiovascular Disease	16 (8)	377 (42)	393 (36)	<0.0001
COPD	6 (3)	121 (14)	127 (12)	<0.0001
Cirrhosis	13 (7)	70 (8)	83 (8)	0.5474
Diabetes	77 (39)	439 (49)	517 (47)	0.0096
Dialysis	8 (4)	24 (3)	32 (3)	0.3040
Immunosuppression	19 (10)	81 (9)	100 (9)	0.8076
Smoking	49 (25)	105 (12)	154 (14)	<0.0001
None	19 (10)	46 (5)	65 (6)	.0163

Serotype Analysis

For all isolates tested (82%) since 2006, serotype IA was the most common cause of all cases (26%) followed by serotype V (22%). Table 3 displays the serotype distribution of isolates tested between 2006 and 2015.

Table 3: Serotype Distribution of Isolates Tested by IGBS Disease Type, 2006-2015

Serotype	Total (n=984) N (%)	Early-onset (n=41) N (%)	Late-onset (n=47) N (%)	All Other (n=896) N (%)
IA	254 (26)	11 (27)	13 (28)	230 (26)
IB	124 (13)	1 (2)	5 (11)	118 (13)
II	136 (14)	7 (17)	0	129 (14)
III	149 (15)	15 (37)	25 (53)	149 (15)
IV	76 (8)	1 (2)	2 (4)	73 (8)
V	215 (22)	5 (12)	2 (4)	208 (23)
VI	5 (0.50)	1 (2)	0	4 (0.50)
VII	3 (0.30)	0	0	3 (0.30)
VIII	2 (0.20)	0	0	2 (0.20)
Nontypeable	20 (2)	0	0	20 (2)

Early-Onset Invasive GBS Prevention Indicators

In 2015, five of the six women with infants having EO IGBS had received prenatal care and four screened for GBS prior to admission (screening for the two remaining women was unknown). No woman had a positive culture. None of the women had bacteruria during pregnancy, a previous infant with IGBS, or a previous pregnancy with GBS colonization.

Guidelines for prophylaxis recommend penicillin or ampicillin, given that GBS is still fully susceptible to both. For women with documented penicillin allergies who are at low risk for anaphylaxis, cefazolin is recommended; if the risk of anaphylaxis is high, then either clindamycin or erythromycin is recommended unless the strain is known to be resistant. In the latter case, vancomycin is preferred.[2]

Discussion

A major focus of surveillance for invasive GBS disease has been the epidemiologic characterization of early-onset disease to assess the impact of screening and treatment guidelines for pregnant women. The screening guidelines for prevention of IGBS, first released in 1996 and revised in 2002 and 2010, have led to national declines in early-onset GBS disease.[3] While complete adherence to the guidelines would not prevent all cases of EO IGBS disease, occurrence would undoubtedly be higher without prenatal screening and appropriate administration of intrapartum antibiotics.

The epidemiologic profile of invasive GBS disease in adults in Oregon is consistent with national data and previous studies.[4] Invasive GBS in nonpregnant adults is increasing, particularly in elderly persons and those with significant underlying diseases.[4] In Oregon, alcohol abuse, and smoking were significantly associated with cases among younger adults, while cardiovascular disease, diabetes, and chronic obstructive pulmonary disease (COPD) were significantly associated with cases among older adults.

Increasing resistance to erythromycin and clindamycin has also been reported nationally and in Oregon.[4] So far in Oregon, however, this increasing resistance does not seem to have translated into broad treatment failures leading to GBS mortality. Continued surveillance of invasive GBS disease among adults will be needed to monitor trends in antibiotic resistance, describe the characteristics of increases in invasive GBS occurrence, and better characterize the disease among this population.

References

1. Centers for Disease Control and Prevention. 2014. Active Bacterial Core Surveillance Report, Emerging Infections Program Network, Group B *Streptococcus*, 2014. Available at http://www.cdc.gov/abcs/reports-findings/survreports/gbs14.htmlAccessed 12 Jul 2015.
2. Centers for Disease Control and Prevention. Prevention of Perinatal Group B Streptococcal Disease – Revised Guidelines from CDC. *MMWR Recomm Rep.* 2002; 51(RR-11)1-22.
3. Centers for Disease Control and Prevention. Early-Onset and Late-Onset Neonatal Group B Streptococcal Disease – United States, 1996-2004. *MMWR*. 2005; 54(47)1205-8.
4. Farley MM. Group B Streptococcal Disease in Nonpregnant Adults. *Clin Infect Dis*. 2001; 33:556-61.