



Barren River District Health Department

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Barren, Butler, Edmonson, Hart, Logan, Metcalfe, Simpson, Warren Counties

Epidemiology of Methicillin Resistant Staphylococcus aureus (MRSA) in the Barren River District, Kentucky, October 2006 - March 2007

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Objective: This limited, voluntary survey was performed to characterize the epidemiology of methicillin-resistant *S. aureus* (MRSA) infections in Barren River District Health Department service area during the 6-month period of October 2006 through March 2007. Health Department staff were requested to investigate an apparent increase in MRSA cases by physicians in one county. As reporting of MRSA cases is voluntary, our survey was intended to provide local physicians with a snapshot of the infection in this area, including drug susceptibility.

Methods: Healthcare providers in the Barren River District Health Department service area were requested in September 2006 to submit a completed *Kentucky Reportable Disease Form* (EPID 200) on patients with culture confirmed MRSA from October 1, 2006 to March 31, 2007. Requests were sent to all physicians and nurse-practitioners in our Communicable Disease and Emergency Preparedness Database.¹ This database covers our eight county service area: Barren, Butler, Edmonson, Hart, Logan, Metcalfe, Simpson & Warren Counties. Information from all EPID 200 forms submitted was tabulated and analyzed by BRDHD Epidemiology staff.

NOTE: Providers were asked to submit information on the standard EPID200 Disease Reporting Form to avoid confusion between form versions. This form, however, requests only demographic and basic case information for initiating an epidemiology investigation. It does not ask providers to differentiate between disease cases acquired in an in-patient setting vs. those that are apparently community-acquired or colonized.

Results: Reports included data on both MRSA infections & colonizations. A total of 374 patient reports were collected from 114 physicians and group practices.

- o Gender information was available for 372 cases: 51.1 % (n= 190) were female, 48.4% (n=180) were male, with 0.5 % (n=2) unknown.

¹ The database includes all primary care providers as well as selected specialties: infectious disease, pulmonology, emergency, OB-GYN, allergy, ENT, oncology, and surgery.

- o Race was reported for 341 cases: 14.1% (n=48) were black, 84.8% (n= 289) were white, 1.2% (n=4) were in other race/ethnic categories.

Table 1. Reported Cases by Gender and Race

Gender	Frequency	Percent	Race	Frequency	Percent
Female	190	51.1%	Black	48	14.1%
Male	180	48.4%	White	289	84.8%
Unknown	2	0.5%	OTHER	4	1.2%

Table 2. Hospitalizations and Mortality

Hospitalization	Frequency	Percent	Died	Frequency	Percent
No	265	70.9%	No	100	26.8%
Yes	83	22.2%	Yes	1	0.3%
Not Reported	16	4.2%	Unknown or Not reported	272	72.9%

- o Patients ranged in age from less than one year through 94 years. Figures 2 and 3 (*on page 6*) compare patients by age group to the overall population of the eight counties.
- o Reports for 374 patients indicated hospitalization status: 22.2% (n=83) needed hospitalization, 70.9% (n=265) were not hospitalized, and 4.2% (n=16) not reported. Again, the EPID 200 reporting form did not distinguish between hospitalizations that were *the result of* MRSA infections and cases that were *acquired during* hospitalization.
- o Only one fatality was reported. For other patients, 26.8% (n=100) did not die, 72.9% (n=272) unknown or not reported, 0.3% (n=1) died.
- o Cases were predominantly skin and soft tissue infections.

Table 3. Case Rates by County *

County	Frequency	Rate / 100,000 for 6 months
Barren	29	72
Butler	22	164
Edmonson	13	108
Hart	7	38
Logan	30	110
Metcalfe	16	155
Simpson	46	268
Warren	211	208
Total	374	155

Case rates per 100,000 for 6 months in each of the counties are shown in Table 3. It must be noted that data reporting was voluntary at the request of the Health Department, and that many cases may not have been reported. For this reason, we cannot make comparisons to state or national estimated rates.

* Rates are based on 2006 population estimate, US Census Bureau.

Culture and Sensitivity - Cultures were collected from a variety of sources including skin and soft tissue, nasal swabs, urine catch, and bronchial wash. Individual labs conducted sensitivity testing in accordance with their internal procedures. Of the 374 cases that were reported we received drug sensitivity results on 261 patients. Their sensitivity pattern is shown in Table 4. Our sample showed that seven antibiotics tested with highest levels of susceptibility for MRSA.

We must note, however, that the attached CDC flyer, “Outpatient management of skin and soft tissue infections in the era of community- associated MRSA, 2007” does not recommend use of Ciprofloxacin and Levofloxacin for treating MRSA infections.

Table 4. Reported Drug Sensitivity Results.

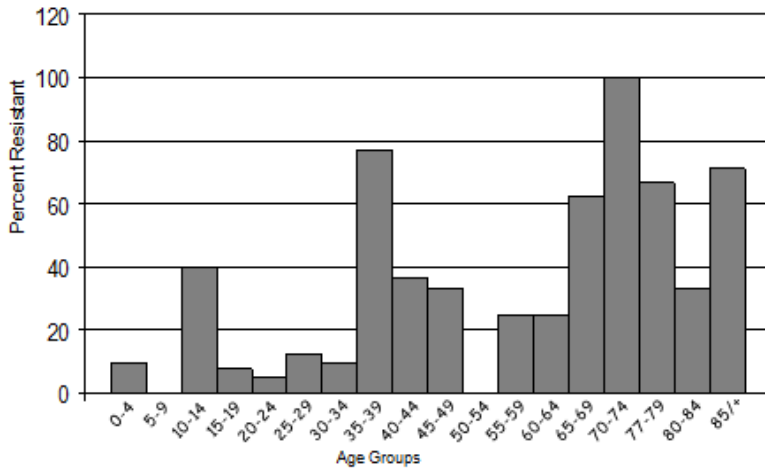
Drug	Resistance		Intermediate		Susceptible		BLac		Comment
	n	%	n	%	n	%	n	%	
Ampicillin	4	3.8%					100	96.2	
Amoxicillin/K Clavulanate	125	100							
Cefazolin	125	100							
<i>Chloramphenicol</i>					7	100			
Ciprofloxacin	84	41.2	2	1	118	57.8			Not recommended to treat MRSA infections
Clindamycin	45	23.8	1	0.5	143	75.7			
Erythromycin	184	92.5	2	1	13	6.5			
<i>Gentamicin</i>			1	0.4	260	99.6			
Levofloxacin	41	31.1	67	50.8	24	18.2			Not recommended to treat MRSA infections
<i>Linezolid</i>					36	100			
Ofloxacin	1	16.7			5	83.3			
Oxacillin	258	100							
Penicillin	46	30.3					106	69.7	
<i>Rifampin</i>	1	0.4	1	0.4	239	99.2			
<i>Tetracycline</i>	4	2.6			147	97.4			
<i>Trimethoprim/ Sulfamethoxazole</i>	1	0.4			259	99.6			
<i>Vancomycin</i>					254	100			

Drug Resistance - Table 5 shows results on drug resistance for Clindamycin. Figure 1 graphs these results.

Table 5. Resistance to Clindamycin.

Age Group	Clindamycin Drug Resistance %
0-4	10.0
5 - 9	0.0
10-14	40.0
15-19	7.7
20-24	4.8
25-29	12.5
30-34	10.0
35-39	77.0
40-44	36.4
45-49	33.3
50-54	0.0
55-59	25.0
60-64	25.0
65-69	62.5
70-74	100.0
75-79	66.7
80-84	33.3
>85	71.4

Figure 1. Drug Resistance to Clindamycin



Limitations: This survey is not a complete report of all cases treated in our area. Since the Commonwealth of Kentucky has not designated MRSA as a mandatory reportable disease, our survey can be a snapshot only, based on voluntary reporting.

Additional limitations result from the data collection instrument itself, which does not ask for data on hospital-associated cases vs. community-associated cases (CA-MRSA). The decision was made to use the current standard EPID 200 reporting form to avoid confusion for medical providers. If future studies are conducted, we will develop a method for gathering this data.

Recommendations: In a CDC webcast on October 26, 2007 Rachel Gorwitz, MD, MPH made the following recommendations:

- I&D should be routine for purulent skin lesions
- Obtain material for culture
- No data to suggest molecular typing or toxin-testing should guide management
- Empiric antimicrobial therapy may be needed
- Alternative agents have +’s and –’s: More data needed to identify optimal strategies
- Use local data for treatment
- Patient education is critical!
- Maintain adequate follow-up

Rachel Gorwitz, MD, MPH is with the CDC’s Division of Healthcare Quality Promotion, and can be reached at RGorwitz@cdc.gov. The audio webcast and Powerpoint slides, *Methicillin*

Resistant Staphylococcus aureus (MRSA) in the Community: Epidemiology and Management” can be downloaded from <http://www.bt.cdc.gov/coca/callinfo.asp>.

We have also attached to this report an informational flyer to help facilitate *Outpatient Management of Skin and Soft Tissue Infections in the Era of Community-Associated MRSA*. It includes considerations and precautions for use of several drugs. The American Medical Association has collaborated with the Centers for Disease Control & Prevention (CDC) and the Infectious Diseases Society of America (IDSA) to produce this informational flyer. The flyer may also be accessed online on the following websites:

http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca_skin.html

<http://www.ama-assn.org/ama/pub/category/18073.html>

<http://www.idsociety.org/>

Another good reference is *North Carolina Consensus Guideline for Management of Suspected Community-Acquired Staphylococcus aureus (CA-MRSA) Skin and Soft Tissue Infections*.
<http://www.unc.edu/depts/spice/CA-MRSA-2007-03-05.pdf>

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References:

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3. Division of Healthcare Quality Promotion (DHQP), National Center for Preparedness, Detection, and Control of Infectious Diseases, *Outpatient management of skin and soft tissue infections in the era of community- associated MRSA, 2007*.
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4. Association for Professionals in Infection Control and Epidemiology, *National Prevalence Study of MRSA in U.S. Healthcare Facilities*, June 2007. <http://www.apic.org>.

5. Society for healthcare epidemiology of America, *SHEA Guideline for Preventing Nosocomial Transmission of Multidrug-Resistant Strains of Staphylococcus aureus and Enterococcus*, 2003. http://www.shea-online.org/Assets/files/position_papers/SHEA_MRSA_VRE.pdf,
6. North Carolina Consensus Guideline for Management of Suspected Community-Acquired Staphylococcus aureus (CA-MRSA) Skin and Soft Tissue Infections. <http://www.unc.edu/depts/spice/CA-MRSA-2007-03-05.pdf>

Figures

Figure 2. Reported MRSA Cases by Age Group.

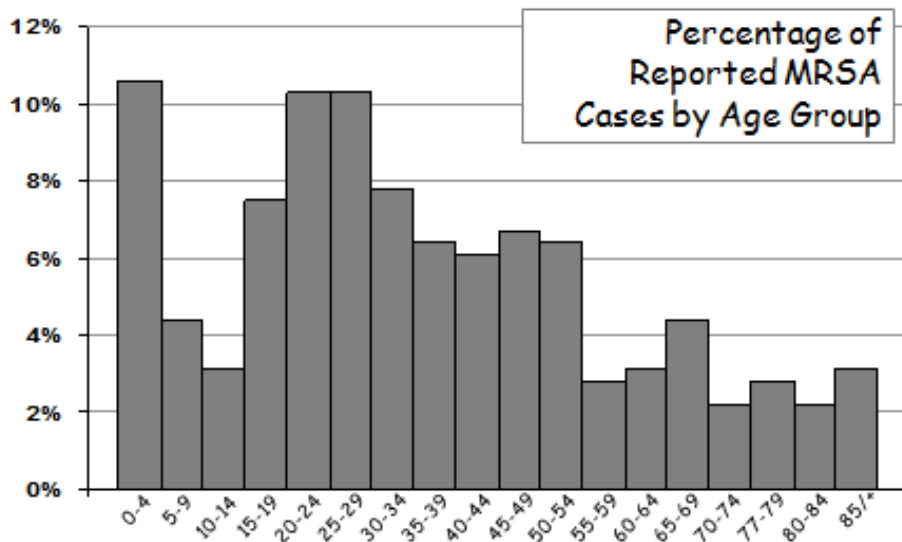


Figure 3. Percentage of Residents by Age Group for the General Population.

