Mississippi State Department of Health

Mississippi Morbidity Report

Volume 25, Number 1 January 2009

Vancomycin-Resistant Enterococci (VRE)

Background: Enterococci are normal constituents of the human gastrointestinal flora. *E. faecalis* and *E. faecium* account for the vast majority of clinical isolates. These microorganisms can survive in a variety of harsh conditions, including extremes of pH, temperature, and oxygen tension and can persist on inanimate objects for protracted periods.

Clinical Relevance: Enterococci lack aggressive virulence factors associated with other bacterial infections. They do have several selective advantages including a potent capacity for tissue adherence and intrinsic resistance to numerous antibiotic classes. Although the agents of choice for susceptible strains, penicillins have reduced affinity to enterococcal penicillin-binding proteins. Cephalosporins, trimethaprim-sulfamethoxazole and clindamycin possess no useful activity. Resistance to other classes, such as fluoroquinolones, has developed rapidly in response to antibiotic pressures, leaving vancomycin as a critical drug in treating enterococcal infections, particularly those with outright penicillin resistance. Some enterococci have developed an alternative pathway for the production of cell wall precursors that renders vancomycin inactive. Vancomycin-resistant strains were initially identified in Europe and were linked to the use of glycopeptide antibiotics in animal feed. VRE has been present in the U.S. since the 1980's and, in contrast to European strains, is associated with person-to-person transmission in healthcare settings.

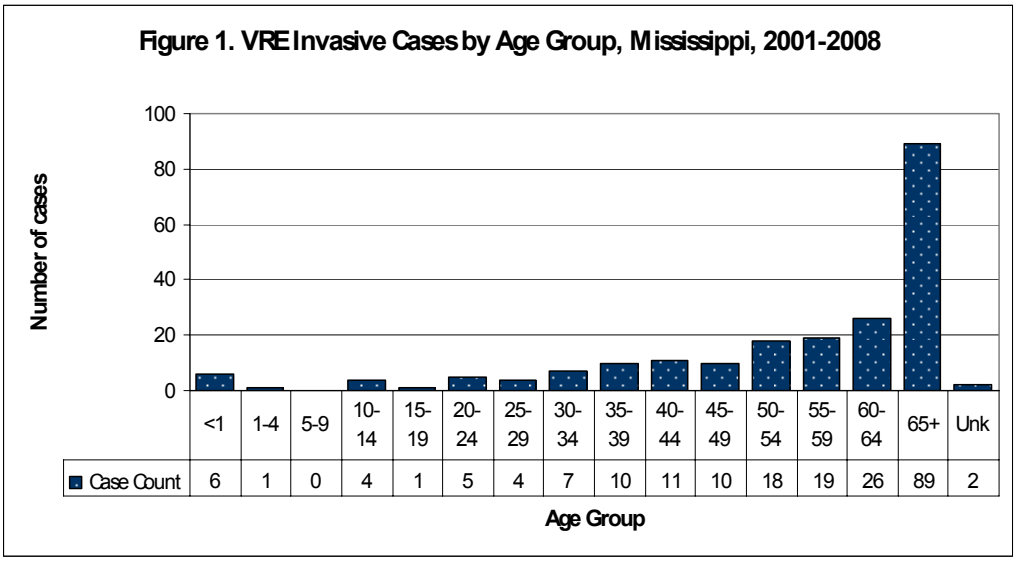
Common forms of infection with enterococci include urinary tract infections, intra-abdominal abscesses, wound infections, bacteremia, and endocarditis. Virtually all such infections occur in the chronically or critically ill who have been previously exposed to potent and broad spectrum antimicrobial regimens. Enterococci are normal constituents of the human intestinal flora and VRE are virtually non-pathogenic in healthy individuals. VRE infections among hospitalized patients are associated with poorer clinical outcomes and considerable cost increases. On average, a VRE infection is estimated to result in 6 days of excess hospitalization, an additional $20,000 in hospital expense, and a two-fold increase in the risk of death.

Infection with VRE is usually preceded by intestinal colonization with the resistant strain. The acquisition of VRE is the result of person-to-person or object-to-person transmission. Any individual colonized with VRE and off of antibiotics may revert to a non-colonized state, but this may take several months (64% reversion at 125 days in one study).

Epidemiology: VRE infection and colonization is directly associated with exposure to health care facilities. CDC estimates that 1 in 8 hospital associated infections are due to enterococci, with 30% in ICU's attributed to VRE. Nationally, VRE infections have roughly doubled in the hospitalized population between 2000 and 2006, disproportionately affecting the older population (>64 years old). Since 2001 in Mississippi, invasive VRE infections have increased considerably, with substantial variability year to year. A large proportion of these cases are >64 years of age (Fig. 1).

Prevention and Control: Prevention can be achieved only by interrupting person-to-person or environmental transmission. Enterococci can survive on counter tops for several days. They frequently contaminate objects such as telephones, door knobs, and medical equipment. As there are no effective mechanisms for decolonizing patients, prevention of transmission is the only effective intervention.

In summary, CDC and the Society for Healthcare Epidemiology of America (SHEA) guidelines recommend the following measures to prevent the transmission of VRE.

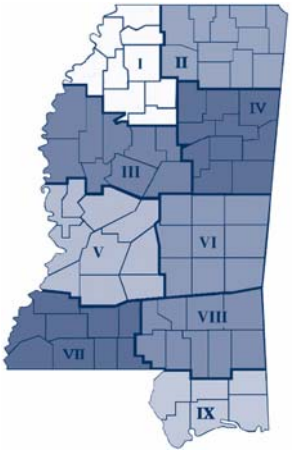


1. **Strict hand hygiene**. As with other pathogens, the hands of healthcare workers are a critical link in the transmission of VRE. Hands should be sanitized before and after each encounter with any patient. Alcohol based hand products are the agent of choice, unless the hands are visibly soiled, in which case antibacterial soap and water are preferred.
2. **Contact isolation and barrier precautions**. Gloves should be worn when entering the rooms of patients affected by VRE at every visit. Hands should be sanitized after glove removal. Disposable gowns should be utilized if any contact with the patient or surrounding environment is anticipated. It is acceptable to cohort VRE patients with other VRE patients if private rooms are unavailable. Patient care equipment, when possible, should be dedicated to individual patients, such as disposable stethoscopes for example. In general, contact precautions should be continued until a patient is free of clinical infection, has been off antibiotics several weeks, and has three sequentially negative stool cultures spaced a week apart.
3. **Antibiotic stewardship**. Antibiotic stewardship programs (multidisciplinary teams of physicians, pharmacists, and nurses) help ensure the proper selection, dosing, and duration of antibiotics. By directing and limiting antibiotic exposures, protective intestinal flora can be preserved. Vancomycin and third and fourth generation cephalosporins are most closely associated with VRE colonization.
4. **Active surveillance**. Active surveillance of high risk patients, such as those with recent hospitalizations or residents of long term care facilities, can detect VRE on admission, allowing for the prompt initiation of isolation measures. Screening cultures for VRE are typically acquired from stool specimens or rectal swabs. For those at highest risk of VRE acquisition during hospitalization, such as ICU patients, periodic screening may be appropriate. In high prevalence settings, assessing the colonization status of all patients may be appropriate.
5. **Environmental Disinfection**. All bedding, equipment, and environmental surfaces should be thoroughly cleansed with approved disinfecting agents.

Per numerous states' guidelines, colonization with VRE should not be used as a criterion for refusing admission to a long term care facility. Strict hand hygiene, universal precautions, and thorough environmental cleaning should be followed as with all patients. Minimizing stool contamination of the environment is particularly important.

Submitted by Thomas Dobbs, MD, MSDH and Skip Nolan, MD, Division of Infectious Diseases, Department of Medicine, UMC

References on request



Mississippi
Provisional Reportable Disease Statistics
December 2008

		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	Dec 2008	Dec 2007	YTD 2008	YTD 2007
Sexually Transmitted Diseases	**Primary & Secondary Syphilis**	2	0	0	0	6	0	1	7	3	19	25	179	132
	Total Early Syphilis	3	5	1	1	22	3	1	10	7	53	70	403	417
	Gonorrhea	57	32	113	37	184	74	32	69	61	659	529	7,494	8,315
	Chlamydia	172	145	328	129	525	161	101	174	156	1,891	1,417	21,248	21,686
	HIV Disease	7	2	10	5	16	3	2	4	9	58	61	615	611
Myco-bacterial Diseases	**Pulmonary Tuberculosis (TB)**	1	0	0	0	1	1	1	3	0	7	22	86	115
	Extrapulmonary TB	0	0	1	0	1	0	0	1	0	3	3	17	22
	Mycobacteria Other Than TB	4	3	0	3	11	4	0	1	7	33	22	307	246
Vaccine Preventable Diseases	**Diphtheria**	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	1	0	0	0	1	1	1	0	0	4	6	98	256
	Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measles	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mumps	0	0	0	0	0	0	0	0	0	0	0	0	2
Viral Hepatitis	**Hepatitis A (acute)**	0	0	0	0	0	0	0	2	0	2	0	7	8
	Hepatitis B (acute)	0	4	0	0	0	0	0	0	1	5	0	52	41
Enteric Diseases	**Salmonellosis**	4	6	1	4	12	4	1	3	3	38	39	1064	1049
	Shigellosis	0	1	0	0	0	0	0	1	0	2	133	288	1425
	Campylobacter Disease	0	1	1	0	0	2	1	2	0	7	9	111	128
	E. coli O157:H7/HUS	0	0	0	0	0	0	0	0	0	0	1	5	7
Other Conditions of Public Health Significance	**Invasive Meningococcal Disease**	0	0	0	0	0	0	1	0	0	1	1	12	12
	Invasive *H. influenzae* b Disease	0	0	0	0	1	0	0	0	0	1	0	3	0
	RMSF	0	0	0	0	0	0	0	0	0	0	0	9	20
	West Nile Virus	0	0	0	0	0	0	0	0	0	0	4	65**	136
	Lyme Disease	0	0	0	0	0	0	0	0	0	0	0	1	2
	Animal Rabies (bats)	0	0	0	0	0	0	0	0	0	0	1	2	3

*Totals include reports from Department of Corrections and those not reported from a specific District.

**Current as of January 12, 2009. An increase in false positive test results obtained from a national reference lab led to the recall of a test kit that was utilized from July 15, 2008 to September 1, 2008. If the WNV test results could not be confirmed through additional test methods performed by CDC or MSDH, the case was deleted from the surveillance case count.

Update—West Nile Virus Case Count, 2008

On October 14, 2008, the Centers for Disease Control and Prevention (CDC) released an advisory regarding an increase in the rate of false positive West Nile virus (WNV) test results associated with a specific lot of the PanBio WNV IgM capture ELISA test kit. Labcorp used this lot at its Viromed facility in Minnetonka, MN from July 18, 2008 to August 31, 2008. The manufacturer voluntarily recalled this testing kit due to the high levels of false-positive results associated with this specific lot.

In Mississippi, during this time frame, 65 specimens tested positive at Viromed with the recalled lot of the PanBio kit. Because these results may have been false-positives a follow up investigation was initiated to obtain repeat samples for confirmatory testing with a different WNV IgM assay. These tests were performed at both the CDC and the MSDH Public Health Laboratory.

As a result of follow up investigations, 36 of the previously reported 101 WNV cases were deleted from the 2008 surveillance case count. Cases were deleted if additional testing failed to confirm the diagnosis, or if a second sample was not available for confirmatory testing. As of January 12, 2009, the provisional 2008 WNV case count is now 65 cases, with three reported deaths. Further updates will be provided as the need arises. As always, feel free to contact MSDH Epidemiology at 601-576-7725 or 1-800-556-0003 with any questions.