Multi-Drug Resistant Organisms (MDRO) Questions About MRSA and Answers From the Experts (MRSA)

Course 30345
Record 2581

Rationale

Exposure to multi-drug resistant oragnisms can potentially cause serious harm to yourself. It is important to understand the dangers and how to protect yourself and others.

Definitions

MDRO: Multi-Drug Resistant Organisms

VRE: Vanocomycin-resistant Enterococci (VRE). Enteroccocci are bacteria that are normally present in the human intestines and in the female genital tract and are often found in the environment. These bacteria can sometimes cause infections. Vancomycin is an antibiotic that is often used to treat infections caused by enterococci. In some instances, enterococci have become resistant to this drug and thus are called vancomycin-resistant enterococci (VRE). Most VRE infections occur in hospitals.

MRSA: Methicillin-resistant *Staphylococcus aureus* (**MRSA**) is a specific strain of the *Staphylococcus aureus* bacterium that has developed antibiotic resistance to all penicillins, including methicillin and other narrow-spectrum β-lactamase-resistant penicillin antibiotics. The resistant strain, MRSA was first discovered in the UK in 1961 and is now widespread, particularly in the hospital setting where it is commonly termed a superbug.

The Uncertainties Surrounding Multidrug-Resistant Organisms

How are MDROs -- MRSA and VRE -- defined? The term MRSA refers to those strains of *S aureus* bacteria that have acquired resistance to the antibiotics methicillin, oxacillin, nafcillin, cephalosporins, imipenem, and/or other beta-lactam antibiotics. Enterococci are gram-positive bacteria that are found normally in the gastrointestinal and female genital tracts. All enterococci have intrinsic low-level resistance to some antibiotics. In recent years, however, some strains of enterococci have acquired high-level *resistance* to multiple antibiotics, including aminoglycosides, ampicillin, and vancomycin. Infection caused by VRE is of special concern, however, because it is very difficult to treat.

What is the difference between *colonization* and *infection* with bacteria, such as MRSA and VRE? *Colonization* refers to the presence of microorganisms in or on a host with growth and multiplication, but without tissue invasion or damage. In the case of MRSA, the body site most commonly colonized is the anterior nares. Other body sites that may be colonized with MRSA include open wounds, the respiratory tract, perineum, upper extremities, umbilicus (in infants), urinary tract, and axilla.

VRE colonization is generally in the stool. MRSA or VRE colonization can serve as a reservoir for the spread of these microorganisms to others, and can lead to infection in the host. Colonized patients are also known as asymptomatic carriers.

Infection is the entry and multiplication of microorganisms in the tissues of the host leading to local or systemic signs and symptoms of infection.

MRSA and VRE can cause invasive and life-threatening infections, such as osteomyelitis, bacteremia, endocarditis, pneumonia, urinary tract infections, intra-abdominal or pelvic infections, vascular line sepsis, and wound and surgical infections.

What is community-acquired MRSA? How is it different from healthcare-acquired MRSA? In epidemiologic investigations, MRSA infections in persons who have not been recently (within the past year) hospitalized or had a medical procedure (such as dialysis, surgery, or catheters) are classified as community-associated MRSA (CA-MRSA) infections. The strains of MRSA that most commonly cause CA-MRSA infections are distinct from those that were already established in healthcare settings. These new strains have now also entered and are being transmitted in some healthcare facilities. However, Rachel Gorwitz, MD, MPh, Medical Epidemiologist with the CDC, emphasizes that clinical management of MRSA infections does not depend on categorization of the infection as healthcare-associated vs community-associated or on strain typing. Treatment of an infection possibly caused by MRSA should be based on the clinical syndrome, severity of the infection, and local resistance patterns. Similarly, infection control practices should be uniform for all patients colonized or infected with MRSA.

Most MRSA infections in otherwise healthy individuals in the community present as skin or soft-tissue infections, such as a boils or abscesses. MRSA skin lesions are frequently confused with spider bites by both patients and healthcare providers. The lesion is red, swollen, and painful and may have pus or other drainage. Less commonly, CA-MRSA infections present as more serious or invasive infections, such as bloodstream infections, pneumonia, or osteomyelitis.

I am confused by the need to isolate a patient who was diagnosed with MRSA in a wound years ago. The hospitals where I have worked stated, "once an MRSA patient, always an MRSA patient." The wound is healed and gone and there are no signs of active infection. Do we really need to isolate these patients? Individuals who become colonized with MRSA tend to remain colonized for months or even years. It is important to realize that individuals colonized with MRSA can serve as reservoirs for MRSA and transmit the bacteria to others, just as those infected with MRSA. This is why many hospitals choose to assume that patients who were formerly colonized with MRSA are likely to still be colonized with MRSA. Their medical records are flagged so that contact precautions can immediately be resumed if these patients return to the hospital. Another option would be to obtain nasal cultures or series of cultures to determine whether former MRSA patients are indeed still colonized.

Our hospital policy is to isolate every patient who is admitted to our hospital unit. Everyone is treated as if they are colonized with MRSA until proven otherwise. Once we obtain a negative culture (usually within 24 hours), we take them out of isolation. Please comment on this policy. Screening all or a high- risk subset of patients for MRSA upon admission to the facility or nursing unit is known as "active surveillance." It is a strategy used to control the transmission of pathogens, such as MRSA, that is widely practiced in northern Europe and Canada and is becoming more common in hospitals throughout the United States. Active surveillance cultures are recommended by the Society for Healthcare Epidemiology of America (SHEA). In a study recently conducted at Brigham and Women's Hospital in Boston, Massachusetts, routine MRSA admission cultures and contact isolation precautions resulted in a 67% hospital-wide reduction in MRSA bacteremia.

The aim of active surveillance cultures is to identify every patient who is colonized with MRSA and to use contact precautions to prevent the spread of MRSA to other patients or to healthcare workers. In some hospitals, high-risk patients are assumed to be carriers of MRSA, and contact precautions are used until a negative culture is obtained.
MRSA and VRE infections increase the duration of hospitalizations, increase mortality, and increase costs. The use of active surveillance cultures and contact isolation is one of several

important strategies available for preventing the transmission of MRSA. Active surveillance of all admissions, as described above, can be streamlined further with the use of rapid diagnostic technology, such as polymerase chain reaction, which can provide a result in 2 hours once the specimen is set up to be processed in the laboratory.

What is the best way to manage a patient with MRSA on a behavioral health unit? Most behavioral health units are low-risk settings for the transmission of MRSA and for infection with MRSA. Patients usually take part in group and activity therapies that make isolation impractical. For this reason, most behavioral health units are treated like community settings, and are considered exempt from hospital isolation guidelines. The exception would be if a patient has an actively draining wound infected or colonized with MRSA. Wounds, if present, should be covered with clean, dry dressings. Gloves and gowns are worn by caregivers if wound contact is necessary.
The best way to prevent the transmission of MRSA on the behavioral health unit is to educate patients and staff members to practice good hand hygiene. Patients should not share potentially contaminated personal items, such as towels, soap, or razors.

If a patient is treated for MRSA or VRE with intravenous antibiotics, is he/she no longer colonized? Treating for MRSA or VRE infection with intravenous antibiotics, even with successful resolution of the infection, does not always mean that colonization is eradicated, emphasized John Jernigan, MD, MS, of the CDC. Signs and symptoms of clinical infection may be gone (fever, swelling, erythema, and purulent drainage) and the white blood cell count may return to normal following antibiotic treatment. However, colonization with MRSA or VRE can persist, and the patient can continue to be a carrier.

Please help our staff determine the correct way to clean in a room after a patient with MDRO has occupied it. We are not sure about how to clean the drapes, walls, and surfaces. Careful cleaning of patient rooms and medical equipment is important to overall control of transmission of MDRO and other pathogens in healthcare facilities. Follow routine cleaning procedures for floors and walls. Surfaces that are visibly soiled should be washed first before disinfecting. Frequently touched surfaces (eg, bed rails, overbed tables, doorknobs, equipment in the immediate vicinity of the patient, bathroom fixtures in the patient's room, etc) deserve special focus and should be cleaned on a more frequent schedule compared with that for minimal touch surfaces (eg, floors). Most US Environmental Protection Agency (EPA)-registered hospital disinfectants should adequately inactivate pathogens, such as MRSA and VRE. Cleaning of curtains is recommended when they are visibly soiled.

At our hospital, MRSA patients are in private rooms but they may also leave their rooms. They have access to the hallway vending machines, cafeteria, etc. Doesn't this contaminate the environment, especially if patients don't comply with precautions? The HICPAC 2006 guideline, *Management of Multidrug Resistant Organisms in Healthcare Settings*, recommends that, if MRSA colonized or infected patients do not have draining wounds, diarrhea, or uncontrolled secretions, healthcare organizations should establish ranges of permitted ambulation, socialization, and use of common areas on the basis of their risk to other patients and on the ability of the colonized or infected patients to observe proper hand hygiene and other recommended precautions to contain secretions and excretions. Noncompliant patients should be confined to their rooms.

What about clients with VRE or MRSA who are cared for at home under hospice care? Nurses and caregivers may not be aware of the patient's MRSA- or VRE-positive status and only general precautions are used. There is no special cleaning in the home or careful handwashing by family, and no surface cleaning of bathrooms or light switches, etc. The patient is also in contact with family, children, and infants at home. In a patient's own home,

the most important infection control measure is good handwashing by all household members. Healthy family members may have patient contact as long as hand hygiene is practiced. Healthcare professionals should always be told whether a patient is colonized or infected with a MDRO, such as MRSA or VRE. The precautions that should be taken by healthcare professionals are the same as those for home healthcare.
The CDC recommends the following precautions for family caregivers of infected persons in their homes:

Caregivers should wash their hands with soap and water after physical contact with the infected or colonized person and before leaving the home;
Towels used for drying hands after contact should be used only once;
Disposable gloves should be worn if contact with body fluids is expected, and hands should be washed after removing the gloves;
Linens should be changed and washed if they are soiled as well as on a routine basis;
The patient's environment should be cleaned routinely and when soiled with body fluids; and
Notify physicians and other healthcare personnel who provide care for the patient that the patient is colonized with an MDRO.

What guidelines are there to prevent the spread of MRSA in long-term care facilities? Can long-term care facilities refuse to accept patients with MRSA? In long-term care facilities, colonized and infected residents serve as the primary reservoirs of MRSA. Asymptomatic colonization of residents' nares is common and difficult to eradicate, even with treatment. Long-term care facilities can safely care for and manage MRSA patients by following appropriate infection control practices. In addition, long-term care facilities should be aware that persons with MRSA, VRE, and other infections may be protected by the Americans with Disabilities Act or other applicable state or local laws or regulations.

The most important component of an infection control program for a long-term care facility is education of staff members with regard to hand hygiene. In making decisions on whether to use contact precautions, one reasonable strategy is to consider the individual patient's clinical situation. For independent residents, one approach is to follow standard precautions, making sure that gloves and gowns are used for contact with uncontrolled secretions, pressure ulcers, draining wounds, stool incontinence, and ostomy tubes/bags. For patients who are totally dependent on healthcare personnel for care and activities of daily living, and for those whose infected secretions or drainage cannot be contained, contact precautions in addition to standard precautions may be more appropriate.

As a rule, long-term care residents who are colonized with MRSA and who do not have draining wounds, diarrhea, or uncontrolled secretions should not be placed in strict isolation or restricted from dining rooms or group activities in an attempt to control transmission of MRSA. Such patients should be permitted to participate in group meals and activities if wounds are covered, bodily fluids are contained, and the patients observe good hygienic practices.

Can a pregnant woman who has frequent bouts with MRSA pass the infection on to her fetus? Approximately 5% to15% of women of childbearing age carry *S aureus* in their vagina.[13] Some recent studies have identified a low prevalence of MRSA in vaginal-rectal cultures obtained to screen for group B streptococcal colonization during late pregnancy.[14] *S aureus* can be transmitted from the maternal genital tract to the fetus or newborn during pregnancy, labor, or delivery, but this type of transmission leading to serious infection or other adverse outcomes appears to be rare.[15] There are no recommendations to routinely screen pregnant women for *S aureus* or MRSA colonization or to attempt decolonization in pregnant women with a history of MRSA infection.

Decolonization is sometimes considered in a patient (pregnant or otherwise) with a history of recurrent MRSA infections that are unresponsive to other measures. Vaginal delivery and breastfeeding are not contraindicated in a woman with MRSA colonization or infection. Active lesions should be kept covered with clean, dry bandages, and women should wash their hands well, particularly after changing wound dressings and before touching their newborn. Obstetrics departments should follow their hospital policy in regard to infection control practices for patients who are known or suspected to be infected or colonized with MRSA.

What precautions should healthcare workers, such as nurses, take if they have been treated for an MRSA infection? Is it safe for them to continue taking care of patients?
Nurses and other healthcare workers who do not have active infections or who have wounds that can be covered and controlled with dressings are permitted to work. Colonization alone does not prevent healthcare workers from working unless they are epidemiologically linked to transmission of an infection. The new HICPAC guideline recommends obtaining cultures of healthcare personnel for target MDROs only when there is epidemiologic evidence linking the healthcare staff member to ongoing transmission.