

UPDATE ON COMMUNITY ASSOCIATED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS: Prevention and Management of the Superbug

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INTRODUCTION

Termed superbug, the media has given rise to more focused attention on Methicillin-resistant staphylococcus aureus (MRSA) infections due to a recent increase in community prevalence of associated infections. The rise of community associated-MRSA (CA-MRSA) infections has emerged nationwide, with several school-acquired cases reported. As a result, this increased awareness has caused a stir among parents and school officials who are now urged to take extra precautions in both the school environment as well as the medical office with doctor visits, resulting in multiple inquiries to pediatricians and medical professionals regarding this strain of bacteria.

No longer considered solely a nosocomial infection, and having found its way into the community, the question is raised as to whether there is something to truly be concerned about with MRSA infections or is this merely hype? Although MRSA is of concern, the label superbug has resulted in a media-inflated scare phrase used to dramatize something that can be appropriately cautioned and educated against. What the media fails to mention during the recent news segments is that part of our healthy population consists of natural carriers of this so-called superbug. MRSA is often present in the nose, axilla, and other areas of the body without pathologic infection in persons who are carriers of the bacteria. This is a key point to note when educating patients and members of the community should questions arise regarding CA-MRSA.

In 1959, methicillin was introduced to treat penicillin-resistant staphylococcus aureus.¹ Soon after, MRSA cases were reported in the United Kingdom followed by other European countries, Japan, Australia, and in 1961 the United States. These infections were mainly isolated in hospitals and nursing homes. More recently, CA-MRSA has emerged infecting our population including not only our diabetic and immunocompromised patients, but in our prisons, as well as healthy children and adults.

In 1981, the first CA-MRSA infection was reported in Detroit.² Now, CA-MRSA infections are considered the most frequent cause of skin and soft tissue infection presenting to US emergency rooms.³ Despite this, a recent article in the Journal of the American Medical Association examined invasive MRSA infections over an 18-month period, and the majority were still health care-associated (85%) compared with only a small percentage being community associated (14%).⁴

CA-MRSA infections typically present as skin infections. Clinically, the infection may appear as red edematous pustules or boils which are painful and contain purulence. MRSA skin infections commonly occur at sites of visible skin trauma, such as cuts and abrasions. MRSA is usually transmitted by direct skin-to-skin contact or contact with items which have the bacteria on them.

EDUCATION & PREVENTION

When educating patients and members of the community, it is important to make them aware that similar to any bacterial infection, prevention is the key to avoiding a pathologic infection caused by CA-MRSA. Practicing good hygiene, keeping surfaces clean, and protecting any open skin injury are general prevention measures that prevent any microbial transmission. Although there is still a debate as to whether anti-bacterial soaps and products actually prevent the spread of infection or increase bacterial resistance, their use is still encouraged. Triclosan, which is the antibacterial/antifungal agent used in household antimicrobial products has been studied to examine whether this everyday product is useful. A study in 2005 showed no significant increase in drug resistance when antimicrobial household agents were used after one year, but it was suggested that further long-term investigation was warranted.⁵ More recently, a September 2007 publication performing a review on various recent studies determined that using household antimicrobial

products did not decrease the bacterial count on hands when compared with ordinary soap. This study also demonstrated, with laboratory data that the potential risk for producing drug resistance is present, warranting further investigation.⁶

Precautions in the office include sterilization of instruments after use and appropriate packaging and labeling; appropriate cleansing of all contact surfaces in the patient room after each patient visit, including blood pressure cuffs and stethoscopes; and informing patients of these measures should any inquiries arise; appropriate staff education regarding MRSA, prevention and implementation of these measures is also key to maintaining a clean practice and appropriate patient education.

Specifically for the healthcare setting, the Centers for Disease Control and Prevention (CDC) has published guidelines for preventing transmission of multi-drug resistant organisms such as MRSA.⁷ In general, these guidelines are divided into 2 main segments. The first is a set of general recommendations for all healthcare settings independent of the prevalence of multidrug resistant organism (MDRO) infections or the population served. This includes administrative measures, education and training of healthcare personnel, judicious use of antimicrobial agents, surveillance, infection control precautions to prevent transmission, and environmental measures. The second segment is intensified interventions to prevent MDRO transmission; specifically indications and approach, and intensified interventions to prevent MDRO transmission.

OUTPATIENT MANAGEMENT

Almost all MRSA skin infections can be effectively treated with antibiotics. For the healthcare setting, the CDC has published guidelines for outpatient management of CA-MRSA.⁸ If a patient presents with signs/symptoms of skin infection (redness, swelling, warmth, pain/tenderness, or complaint of “spider bite”) and presence of drainage/purulence, then drainage of the lesion with culture and sensitivity is performed. Appropriate wound care and hygiene education is given with appropriate follow-up. The CDC only recommends antimicrobial therapy at this point if systemic symptoms are present, if there are severe local symptoms, if the patient is immunocompromised, or if there is no response to the incision and drainage.

If there is no drainage/purulence present, then antimicrobial therapy with coverage for Streptococcus and/or other suspected pathogens with consideration for MRSA is started with close follow-up. If there is no

response and MRSA coverage was not initiated initially, then agents with MRSA coverage is performed.

Outpatient empiric therapy options listed by the CDC include clindamycin, tetracyclines (doxycycline, minocycline), Trimethoprim-Sulfamethoxazole, Rifampin (only in combination with other agents), and Linezolid.

INPATIENT MANAGEMENT

The CDC guidelines recommend consultation with an infectious disease specialist as well as appropriate MRSA isolation precautions for inpatient management of MRSA infections.⁹ In patients requiring hospitalization who present with severe local and systemic symptoms, or who may be immunocompromised, and may require surgical intervention, intravenous antimicrobial agents are suitable management options. In such cases, Vancomycin remains the first-line antibiotic therapy. Other intravenous agents such as clindamycin, daptomycin, linezolid, quinopristin-dalfopristin, tigecycline, and TMP/SMX may be considered in some cases. Final inpatient and discharge therapy decisions should be based on results of cultures and antimicrobial susceptibility testing and patient response to therapy.

As is true for any type of infection, MRSA can be a fatal if not treated judiciously. In healthy individuals and children, CA-MRSA infections will typically present as skin infections, and while the media has focused its attention on MRSA or superbug, the truth is, most MRSA infections can be prevented and treated with common oral antibiotics. More serious infections may need more aggressive treatment with intravenous antibiotics and/or surgical intervention.

It is important to remember to maintain these techniques as a part of everyday good practice methods. However, in a time of increased media attention, education remains key, and it is important to reassure patients and staff that the appropriate precautions and measures have been and continue to be in place to promote their health and safety.

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