

Methicillin-Resistant Staphylococcus Aureus (MRSA)

Methicillin-resistant Staphylococcus aureus (MRSA) is a type of staph bacteria that is resistant to certain antibiotics called beta-lactams. These antibiotics include methicillin and other more common antibiotics such as oxacillin, penicillin, and amoxicillin. In the community, most MRSA infections are skin infections.

Bacteriology

Methicillin-resistant Staphylococcus aureus (MRSA) refers to Staphylococcus aureus isolates that are resistant to all currently available β -lactam antibiotics (penicillins, cephalosporins and carbapenems). Methicillin-resistant Staphylococcus aureus (MRSA) is a non-spore forming, gram positive cocci that is non-motile and usually found in clusters. Many MRSA strains produce exotoxins including staphylococcal enterotoxins A,B,C,D,E, toxic shock syndrome toxin (TSST-1) and exfoliative toxins A, and B. Once MRSA becomes endemic within a hospital, it is rarely eliminated and may eventually account for 5 – 50% of all nosocomial Staph infections.

Clinical Manifestations

MRSA in healthcare settings usually causes more severe and potentially life-threatening infections, such as bloodstream infections, surgical site infections, or pneumonia. The signs and symptoms will vary by the type and stage of the infection. In the community, most MRSA infections are skin infections that may appear as pustules or boils which often are red, swollen, painful, or have pus or other drainage. They often first look like spider bites or bumps that are red, swollen, and painful. These skin infections commonly occur at sites of visible skin trauma, such as cuts and abrasions, and areas of the body covered by hair (e.g., back of neck, groin, buttock, armpit, beard area of men).

Epidemiology of Transmission

At any given time, between 20 and 30 per cent of the general population carry Staph bacteria and /or MRSA on their hands or in their noses, but are not ill. Transmission is generally by contact with nasal carriers (30-40% of population); from contact with draining lesions or purulent discharges, spread person-to-person or by ingestion of food containing staphylococcal enterotoxin (food may be contaminated by food handlers' hands). The incubation period is highly variable and can be indefinite due to colonization. Most commonly the incubation period is 4-10 days; however, disease may not occur until several months after colonization. The related incubation interval between eating food and onset of symptoms is usually 2-4 hours but can be as short as 30 min up to 8 hours.

Basic Prevention

The importance of hand hygiene in the elimination of MRSA transmission cannot be overstated. Alcohol-based hand sanitizers ($\geq 70\%$ ethanol) may be helpful as an adjunct method of hand hygiene, but should not replace washing with soap and water.

Any wounds that are draining or have pus must be kept covered with clean, dry bandages. Pus or other drainage from the wound can contain MRSA, so make sure that the bandages and tape used to cover the wound are properly discarded.

Avoid sharing personal items. Bacteria can be transferred to another person through contact with items such as towels, razors or washcloths so try to avoid sharing these items. Make sure any soiled clothing is washed; water and regular laundry detergent is sufficient.

Prevention Measures

In addition to Routine / Standard Precautions, Contact Precautions should be implemented with patients who are suspected or confirmed to have MRSA.

- Patients with suspected or confirmed MRSA may be placed in private rooms or cohort with other patients with the same infection.
- Follow hand-hygiene guidelines by either carefully washing hands with soap and water or using Alcohol-Based Hand Sanitizers (ABHS) after contact with patients with influenza infection
- Use gowns and gloves when in contact with, or caring for patients who are symptomatic with MRSA for all interactions that may involve contact with the patient or potentially contaminated areas in the patients environment
- Asymptomatic MRSA-colonized HCWs rarely transmit MRSA to patients. Current guidelines do not recommend restricting work activities unless colonized HCWs are found to be the source of MRSA transmission.

Environmental Control Measures

MRSA has been found to survive in the environment from 1 to 56 days on common hospital materials and on skin from 30 min to 38 days. People colonized with MRSA continuously shed into the environment.

Hospital-grade cleaning and disinfecting agents are sufficient for environmental cleaning in the context of MRSA. All horizontal and frequently touched surfaces should be cleaned daily and when soiled. The

healthcare organization's terminal cleaning protocol for cleaning of the patient's room following discharge, transfer or discontinuation of Contact Precautions should be followed. All patient care equipment (e.g., thermometers, blood pressure cuff, pulse oximeter, etc.) should be dedicated to the use of one patient. All patient care equipment should be cleaned and disinfected as per Routine / Standard Practices before reuse with another patient or a single use device should be used and discarded in a waste receptacle after use. Toys, electronic games or personal effects should not be shared by patients.

References:

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4. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, HICPAC, 2007
5. Guide to the Elimination of Methicillin-Resistant Staphylococcus aureus (MRSA) Transmission in Hospital Settings, 2nd Ed. APIC 2010.