Post exposure management: Methicillin-Resistant Staphylococcus aureus (MRSA) in the laboratory

BACKGROUND

Methicillin-resistant staphylococcus aureus (MRSA) is a strain resistant to the antibiotic, methicillin (a closely related antibiotic to penicillin, resistance to which usually includes resistance to all penicillin-derived antibiotics). It causes both self-limiting and life-threatening diseases in humans. This bacterium is naturally found on humans, primarily in the nose and on the skin. The primary reservoir hosts of S.aureus are humans, wild and domestic animals. Person-to-person transmission can occur from contact with a purulent lesion or with a carrier's skin. Transmission between patients and health care workers can be common in health care settings via inadequately washed hands or by fomites. Nasal colonization can by asymptomatic or can lead to autoinfection and auto-reinfection. Additionally, unsanitary conditions can increase exposure to S.aureus. Inhaling MRSA into the lungs can result in extremely severe pneumonia. In the community, most MRSA infections are skin infections. More severe or potentially life-threatening MRSA infections occur most frequently among patients in healthcare settings.

SCOPE

This protocol is a component of the Occupational Health Management System and Post exposure management as outlined in the Occupational Health Policy. Biological agents approved for use within King Abdullah University of Science and Technology (KAUST) research present potential hazards and health risks and have the potential to cause laboratory acquired infection (LAI). LAI can occur via needle stick, laceration causing broken skin or mucous membrane(s) splash. While LAI is a rare event, KAUST takes proactive measures to mitigate risks to researchers.

POST EXPOSURE MANAGEMENT

In laboratory associated MRSA exposure, the main route of infection is via hands contaminated from contact with colonized or infected animals or devices from these animals. Personnel with eczema, rashes or skin breaks are at increased risk for infection following exposure, particularly in individuals who do not wear gloves with routine animal handling. Immunocompromised individuals and those without a functioning spleen are also at increased risk.
Meticulous wound cleansing after exposure to MRSA is important in preventing infection. Follow up health care after an exposure incident is recommended if the nature of the wound requires additional care (sutures, etc.). Further care should also be sought for any developing signs of infection such as redness, drainage, swelling, fever, or chills.

Mode of Transmission	Treatment
Needle stick, Animal Bite, Laceration	Immediately wash the wound with soap and water for 15 minutes. Decontaminate any exposed skin surfaces with an antiseptic scrub solution.
Mucous membranes (Eyes, nose, mouth)	Use sterile saline or water to irrigate for 15 minutes, preferably in an eye wash station. Rinse out mouth without swallowing.
Inhalation	If contaminated materials are aerosolized and potentially inhaled, rinse out mouth without swallowing.
Intact skin	Wash the area thoroughly with soap and water.

GUIDANCE

Reporting & treatment:

Report immediately to KAUST Health for additional support and medical attention. The healthcare provider should be provided with information about the specific organism and strain involved, route of exposure and inoculum concentration.

Employees must inform their supervisors of any work-related exposures, injuries or illnesses as soon as possible and report by end of the shift and report the incident via the SALUTE portal. Follow up with Occupational Health will occur to ensure fitness to return to work after all exposure incidents. Please contact the Occupational Health specialist post-treatment for further guidance.
Treatment of MRSA infections should be based on the results of the sensitivities from the clinical cultures. Empiric treatment for non-critical illnesses can include Doxycycline, Bactrim, Clindamycin and Vancomycin. For more severe infections, empiric treatment should include intravenous antibiotics.

Symptoms: Symptoms are dependent on the site of infection. Systemic infection may cause fever, headache malaise, and myalgia. Most *S. aureus* skin infections, including MRSA, appear as a bump or infected area on the skin that might be:

- red
- swollen
- painful
- warm to the touch
- full of pus or other drainage
- accompanied by a fever

Incubation Period: 4-10 days

Viability: Susceptible to many disinfectants – 1% sodium hypochlorite, iodine/alcohol solutions, glutaraldehyde, and formaldehyde.

Vaccination: None available

References:

CDC

Health Canada

Mandell, Douglas, and Bennett's Principles and practices of Infectious Disease 6th Edition, Elsevier, 2005.