2005 Infection Control Update: Practical Approaches to Community-Associated Methicillin-resistant *Staphylococcus aureus* (CA-MRSA)

Satellite Conference
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2:00- 4:00 p.m. (Central Time)

Produced by the Alabama Department of Public Health
Video Communications Division

Faculty

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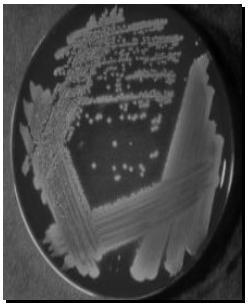
Objectives

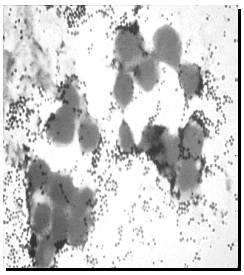
- Compare the differences between community-associated (CA-MRSA) and healthcare-associated methicillin-resistant Staphylococcus aureus (MRSA).
- Define the terms "colonization" and "infection" as they apply to MRSA.

Objectives

- List the five "C" factors which have been identified as common to outbreaks of CA-MRSA.
- Identify strategies to be taken to decrease transmission of CA-MRSA.

Staphylococcus aureus





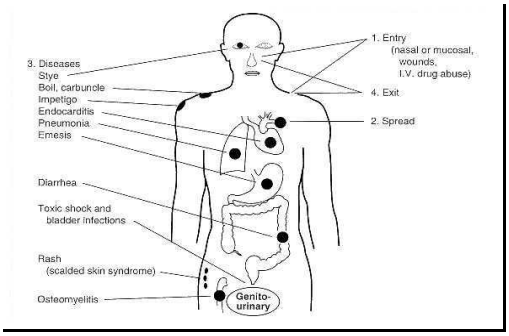
Staphylococcus aureus

- One of the most common causes of skin infections in the U.S.
- One of the major causes of hospital-acquired infections in the U.S.
- 40% of adults are colonized with it.
- 50-90% of health care workers are colonized with it.

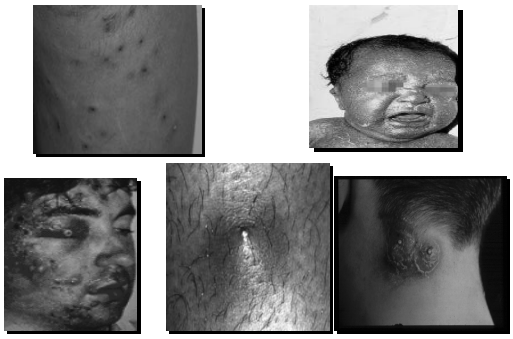
Colonization vs. Infection

- **Colonization:**
  The organism is present in or on the body BUT….
  it usually requires no treatment and does not spread to others.
- **Infection:**
  The organism is present in or on the body AND…
  it is causing illness- there will be signs and symptoms and requires treatment.

Staph Infections



Staph Infections



What is the most common mechanism of transmission for S*taphylococcus aureus infections?*

Antimicrobial Resistance

- **Drug resistance occurs when microbes develop ways to survive the use of medicines meant to kill or weaken them.**
- **If a microbe is resistant to many drugs, treating the infection it causes can become difficult or even impossible.**

Methicillin

- **An antibiotic commonly used to treat staph infections.**
- **Although very effective in treating most staph infections, some staph bacteria develop resistance to the drug and can no longer be killed by the antibiotic.**

MRSA

These resistant bacteria are called Methicillin-resistant *Staphylococcus aureus or* MRSA.

MRSA Transmission

- Contact spread (via hands) is the *primary* means of transmission.
- Environmental contamination *may* lead to the spread of MRSA.

Conditions Which Increase the Risk of Acquiring MRSA

- Severity of illness.
- Previous exposure to antimicrobial agents.
- Repeated contact with the healthcare system.
- Advanced age.
- Previous colonization by a multi-drug resistant organism.

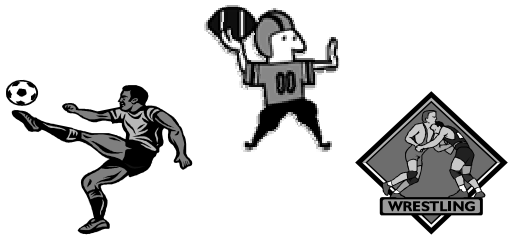
Conditions Which Increase the Risk of Acquiring MRSA

- Underlying diseases or conditions:
  - Insulin-dependent diabetes mellitus
  - Peripheral vascular disease
  - Chronic renal disease
  - Dermatitis or skin lesions
- Invasive procedures, such as:
  - Dialysis
  - Presence of invasive devices
  - Urinary catheterization

MRSA Facts

- The exact percent of colonization of the general population is unknown.
- There is a 60% prevalence among patients in U.S. intensive care units.

Community-Associated MRSA (CA-MRSA) Infections



Community-Associated MRSA (CA-MRSA) Infections

CA-MRSA Reported Outbreaks:

- Athletic teams
- Correctional facilities
- Men who have sex with men (MSM)
- Injecting drug users
- Day care facilities
- College campuses
- Military recruits
- Pacific Islanders, Alaskan Natives, and Native Americans

CA-MRSA

- In the U.S. a little more than 10% of all MRSA infections are CA-MRSA.
- Hospitalization is required in approximately 1 out of every 5 cases.
- Causes illness in persons <u>outside</u> of hospitals and healthcare facilities.
- Usually in persons with no medical history of MRSA infection or colonization.

CA-MRSA

- Diagnosis made in outpatient setting or by positive culture for MRSA within 48 hours after hospital admission.
- Usually in persons who have no permanent indwelling catheters or invasive medical devices.

CA-MRSA

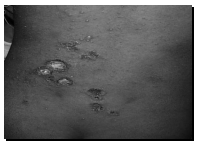
- Persons with no medical history in the past year of:
  - Hospitalization
  - Admission to a nursing home, skilled nursing facility, or hospice
  - Dialysis
  - Surgery

Five Common "C" Factors of CA-MRSA

1. <u>Compromised skin</u> – abrasions from scrapes or existing skin disease.

Five Common "C" Factors of CA-MRSA

2. Contact - frequent and very often vigorous skin-to-skin contact.

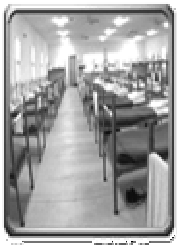


Five Common "C" Factors of CA-MRSA

3. Contaminated surfaces and shared items:
   - sports and weight-lifting equipment
   - shared towels and uniforms
   - changing tables and toys

Five Common "C" Factors of CA-MRSA

4. Crowding –
   When people are very close to one another, it increases the likelihood of skin-to-skin contact and contamination of the environment.



Five Common "C" Factors of CA-MRSA

5. Cleanliness –
   Often less than optimal showering conditions, lack of soap usage, and cleaning of equipment.

MRSA

- Hospital acquired:
  - multi-drug resistance
  - infection sites: multiple
  - does not have the USA 300 clone
- Community-associated:
  - reduced drug resistance
  - infection sites: skin and soft tissues
  - has a unique clone (USA 300) commonly seen in skin & soft tissue infections

CA-MRSA

- Recent CA-MRSA outbreak findings suggest there are some biologic properties (such as virulence factors) which may allow the CA-MRSA strains to spread more or cause more disease.
- Further studies are being done to confirm this hypothesis.

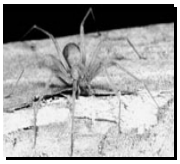
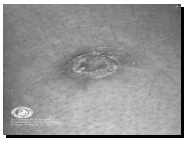
CA-MRSA

- Is there an increase in MRSA disease in the community?

OR

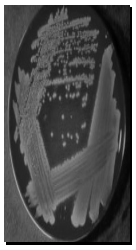
- Is there an increased *awareness and recognition* of MRSA disease?

Spider Bite?

CA-MRSA Diagnosis

- Confirm presumptive diagnosis by sending a specimen of the infected wound (either a small biopsy of skin or a swab for culture of the drainage/pus) to a microbiology lab for culture and sensitivity.



CA-MRSA Treatment

- Treatment will depend on the individual patient's condition.
- Often times, an I&D (incision and drainage) is <u>all</u> that is needed with appropriate follow-up wound care and good hygiene.

CA-MRSA Treatment

- If antibiotics are prescribed it is most important to:
  - Take the antibiotics as prescribed.
  - Complete the entire prescription amount – do not stop taking because the wound looks/feels better.
  - Do not share antibiotics with others.
  - Some antibiotic treatments will need to be given I.V.

Transmission Prevention

- Follow HC provider's instructions.
- Keep draining lesions covered with clean, dry dressings or bandages.
- Proper disposal of bandages.

Transmission Prevention

- Prudent hygiene measures -
  Hand washing,
  Hand washing,
  Hand washing!!

Transmission Prevention

- Hand hygiene:
  - An alcohol-based hand rub can be used if the hands are not obviously contaminated and at times when soap and water are not available.
  - Liquid soap, preferably an antibacterial, should be used if there is a known case of CA-MRSA in a household or among individuals who are in close contact (i.e., athletic teams, military recruits, correctional facilities, etc.)

Transmission Prevention

- Avoid sharing personal items that may have had contact with the infected wound and potentially infectious material.
- To kill the bacteria, wash soiled linens & clothes separately in hot water with a laundry detergent.
- Dry clothes in a hot dryer.

Transmission Prevention

- Clean the inanimate environment with a commercial disinfectant or a fresh (mixed daily) 1:100 solution of bleach and water (1 tablespoon bleach in 1 quart of water).
- Infected persons should inform all of their health care providers that they have an antibiotic-resistant *Staphylococcus aureus* skin infection.

Transmission Prevention

- Education is most important!
- Education of:
  - healthcare professionals.
  - the lay public (including children)
  - those at high risk of acquiring infection:
    - participants of contact sports
    - correctional facility inmates
    - day care workers
    - military recruits

Education Points:

- Importance of hand hygiene.
- Technique of good hand hygiene.
- Importance of good body hygiene.
- The 5 Common C Factors of CA-MRSA.
- The importance of taking antibiotics as prescribed.
- The importance of proper wound care.

Five Common "C" Factors:

1. Compromised skin
2. Contact (frequent)
3. Contaminated surfaces and shared items
4. Crowding
5. Cleanliness

CENTRIFUGE

- Has a new form been started for this calendar year?
  _____yes _____no
- Is a cover available for the centrifuge?
  _____yes _____no
- Have the RPM's been checked this year? (Done by TCs)
  _____yes _____no

CENTRIFUGE

- If there is a timer, has the timer been calibrated?
  _____yes _____no
- Has monthly maintenance been performed?
  _____yes _____no

REFRIGERATORS

- Is there food in the laboratory refrigerator?
  _____yes _____no
- Is it clean inside?
  _____yes _____no
- Has the temperature been documented every day the clinic is open?
  _____yes _____no

REFRIGERATORS

- Are the temperatures within acceptable ranges?
  _____yes _____no
- If temperatures are not in range, has corrective action been documented?
  _____yes _____no

INCUBATORS (If available in clinic)

- Is the incubator clean inside?
  _____yes _____no
- Are the climate controlled bags sealed properly?
  _____yes _____no

INCUBATORS
(If available in clinic)

- Is the temperature documented every day the clinic is open?
  _____yes _____no
- Are the temperatures within acceptable range?
  _____yes _____no

EXPIRATION DATES

- Are the following within acceptable dates?
- Blood collection tubes___yes ___no
- Urine pregnancy tests ___yes ___no
- CO2 ampules ___yes ___no
- HemoCue cuvettes ___yes ___no
- GC media ___yes ___no
- Urine dipsticks ___yes ___no
- Chlamydia swabs ___yes ___no
- Gonostat swabs ___yes ___no

HEMOCUE

- Is it documented that the HemoCue has been cleaned every day of use?
  _____yes _____no
- Is there visible blood or serous fluid on the outside of the HemoCue?
  _____yes _____no
  - If so question the maintenance log. This blood should be removed during daily cleaning.

HEMOCUE

- Is the monthly maintenance documented?
  _____yes _____no
- Is there corrective action documented for any problems that caused a delay in patient testing?
  _____yes _____no
  - Any problems you have with your HemoCue should be documented on the HemoCue chart.
- Are temperatures recorded in each room that contains a HemoCue?
  _____yes _____no

MICROSCOPE

- Is there documentation that the optics have been cleaned daily?
  _____yes_____no
- Is there documentation that the microscope was covered at the end of each day?
  _____yes_____no
- Is there documentation that KOH has been checked for contamination?
  _____yes_____no

MICROSCOPE

- Is there documentation that saline has been checked for contamination?
  _____yes_____no
- Is there a spare bulb available for your microscope?
  _____yes_____no
- Do you have lens paper? Anything else will damage the lens.
  _____yes_____no

MICROSCOPE

- Do you have lens cleaner? Microscope does not get clean without it.
  _____yes_____no
- Is the annual professional microscope cleaning documented on the microscope maintenance chart?
  _____yes_____no

RPR ROTATOR

- Is there documentation that the rotator was cleaned monthly?
  _____yes_____no
- Is there documentation that the rotation circumference was checked quarterly?
  _____yes_____no
- Is there documentation that the timer was calibrated quarterly?
  _____yes_____no

RPR ROTATOR

- Are STD logs up to date with all required information?
  _____yes_____no
- Is control information complete on the STD patient log?
  _____yes_____no
- Are all STD laboratory records easily retrievable? _____yes_____no

DARKFIELD MICROSCOPE

- Is there documentation that the optics have been cleaned daily?
  _____yes_____no
- Is there documentation that the microscope was covered at the end of each day?
  _____yes_____no
- Is there a spare bulb available for your microscope?
  _____yes_____no

DARKFIELD MICROSCOPE

- Do you have lens paper? Anything else will damage the lens.
  _____yes _____no
- Do you have lens cleaner? Microscope does not get clean without it.
  _____yes _____no

DARKFIELD MICROSCOPE

- Is the annual professional microscope cleaning documented on the microscope maintenance chart?
  _____yes_____no
- Is immersion oil available?
  _____yes_____no

County Clinic Personnel

- Please list all personnel performing laboratory testing, including CRNP's, RN's, Clinic Aides, and Laboratory Technicians if available.

  _____
  _____
  _____
  _____
  _____

- Please update and send to the Quality Management Office whenever you have personnel changes.

Upcoming Programs

Exam Documentation:
Adopting A Risk Management Mindset
Thursday, August 4th
2:00 - 4:00 p.m.

Avian Influenza: Implications for Agriculture and Public Health
Tuesday, August 9th
12:00 - 1:30 p.m.

For a complete listing of upcoming programs visit:
www.adph.org/alphtn