Community Associated Methicillin-Resistant *Staphylococcus Aureus* Infections

(CA-MRSA)

Staphylococcus Aureus

- Bacteria commonly carried on the skin or in the nose
- 25-30% population is colonized with “staph”
- Cause of infections
  - Minor (skin and soft tissue)
  - Major infections (blood, pneumonia, surgical site)
- Staph is the most common cause of skin infections

Methicillin Resistant Staphylococcus Aureus- MRSA

- The staphylococcus bacteria has developed resistance to antibiotics that are normally used to treat infections (methicillin, oxacillin, penicillin, amoxacillin)
- 1% population is “colonized” with MRSA

Healthcare Associated Methicillin Resistant *Staphylococcus Aureus* HA-MRSA

- Typical and growing problem in the USA since early 1980's
- Associated with prolonged hospitalizations
- Frequent use of broad spectrum antibiotics
- Long term care residents up to 33% colonized
- Resistant to drugs beyond beta lactams
- 1999-2003 study of ICU patients 53% of Staph infections were MRSA

Community-Associated MRSA (CA-MRSA)

- Spread of MRSA into the community
- No previous(within the year) healthcare associated (hospitalization) exposure or procedures (dialysis, surgery, catheterizations)
- Attacking previously health younger people
- Primarily skin infections
- 5% of the CA-MRSA strains carry a PVL (toxin) associated with increased virulence
- Some CA-MRSA pneumonia following respiratory viral infection (usually influenza) rapidly progressing (with PVL) has a 37% mortality

Reported Outbreaks of CA-MRSA

- Close-contact sports
  - Football
  - Wrestling
  - Rugby
  - Soccer
  - Fencing
- Correctional Facilities
- IV drug-users
- Military Bases
- Daycare Facilities

Risk factors for the spread of CA-MRSA

- Close skin-skin contact
- Openings in the skin such as cuts or abrasions
- Exposure to contaminated items or surfaces
- Crowded living conditions
- Poor hygiene


A
B


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Treatment for Skin and Soft Tissue CA-MRSA Infections

- Incision and drainage by a trained healthcare provider
- Wound care provisions
- If antibiotics are also recommended, a completed course

CA-MRSA Athletic Teams

- 1998 first reported
- Risk factors
  - Physical contact
  - Skin damage
  - Sharing of (contaminated) equipment or clothing

CA-MRSA Athletic Teams

- Fencing- shared equipment and protective clothing chafe, “sensing” wire
- Football- turf burns, shared whirlpools (inadequately cleaned) unwashed towels and pads, sharing of balms and salves
- Wrestlers- skin trauma, skin to skin exposure of open wounds

CA-MRSA Athletic Teams

- Prevention
  - Shower after all practices/competitions
  - Hand hygiene
  - Cover open wounds until healed or exclude from practice/competition
  - Launder personal items after each use
  - Clean/launder shared equipment at least weekly
  - Establish a cleaning routine for shared equipment and whirlpools
  - Consult with a healthcare provider for non-healing wounds

CA-MRSA Athletic Teams

- Additional prevention measures
  - Ensure the availability of adequate running water and soap (not bar) for washing
  - Discourage sharing of towels and personal items i.e. salves and balms
  - Provide training in basic first aid

CA-MRSA in a Correctional Facility

- 1999 Mississippi State Health Department notified CDC of 31 inmates with MRSA
- Skin and soft tissue infections with signs and symptoms(pus, pain warmth, tenderness)
- Furuncles, skin abscesses, open wounds, cellulitis, and two systemic infections
- Cultured inmates to check MRSA colonization rates
  - Female 5.9%
  - Male 2.5%

CA-MRSA in a Correctional Facility

- Treatment: systemic antibiotics, topical antibiotics, incision and drainage, dressing changes
- Resolved in a median of 3 weeks

CA-MRSA in a Correctional Facility

- Conducted inmate interviews to determine risk factors for transmission . . . .
  - Inmate interview revealed 90% of the inmates changed their own dressing,
  - 33% of those infected with MRSA helped or were helped with dressing changes by others
  - 58% of those infected with MRSA, lanced their own boils or asked others with tweezers or fingernails to lance it
  - 89% shared personal items such as (contaminated) linen, pillows, clothing, tweezers, and (bar) soap

CA-MRSA in a Correctional Facility

- Recommended outbreak prevention measures
  - Optimizing antimicrobial treatment of infected inmates
  - Reinforcing standard precautions in the clinics
  - Inmate education for personal hygiene and wound care
  - Using antimicrobial soap
  - Establish MRSA surveillance
- Additional recommendations
  - Failed staph skin infection treatments should suspect MRSA and consider culturing
  - Treat infections based on the susceptibility patterns
  - Daily inmate showers

Correctional Facilities

- Risk assessment for isolation- determine their ability to be compliant with covering the wound, wound management and hand hygiene
- Cohort only those with confirmed MRSA infections
- Do education upon admission regarding, sharing of personal items, hand washing, personal hygiene
- Laundry- hot water wash, hot dryer setting, use bleach if available and appropriate. No hand laundering if infected
- Environmental disinfection- monitor compliance
- BOP policies- appropriate if followed
- Inmate skin assessment- initial and ongoing
- Surveillance- reporting

Prevention and Control CA-MRSA

- Education
  - Transmission prevention
- Appropriate antibiotic use
  - Not for viral infections
  - No saving it for “future” needs
- Vaccination- influenza, pneumococcal

Infection Control Measures

- Appropriate use of Antimicrobials
- Appropriate cultures and treatment regimens for infections
- Proper wound care protocols and drainage containment
- Appropriate barrier precautions (gloves, and mask, gown, eye shield when necessary) – use Standard Precautions at all times
- Respiratory (cough etiquette) Hygiene
- WASH HANDS !!! (Soap or Alcohol-based rubs)

Hand Hygiene

1. Turn on the water slowly do not use hot water
2. Apply soap to the hands and wrists
3. Vigorously rub hands in a rotary motion paying special attention to between fingers, knuckles and nails
4. Wash hands for a minimum of 15 seconds
5. Hold the hands and wrists down under the running water allowing the water to rinse
6. Dry hands using a single paper towel
7. Use the paper towel to turn off the faucet
8. Discard paper towel

When to wash hands

- Before going off duty
- Before and after performing a bodily function i.e. use of a tissue, contact with the face, contacts or hair and use of the toilet
- Before preparing, serving or eating food
- Before preparing or administering medicine
- After direct or indirect contact with patient excretions, secretions, or blood even if gloves are used, gloves are never a substitute for hand washing
- After removal of gloves
- when hand are visibly soiled

Infection Control Measures cont.

- Appropriate disinfection of equipment and the environment (follow directions precisely)
  - Right dilution
  - Appropriate contact time
  - Done thoroughly
  - Monitor compliance
- Appropriate isolation precaution
  - MRSA: cohort patients, standard↔contact precautions

Infection Control Measures cont.

- Ensure surfaces are adequate for cleaning
  - Furniture and equipment that are ripped or torn must be discarded or repaired (no duct tape)
- Ensure proper order of cleaning, isolation rooms last
- Special procedures for blood and body fluid spills

Prevention and Control

- Educate inmates to practice good hygiene:
  1. Keep cuts and scrapes clean and covered with a bandage until healed
  2. Keep your hands clean by washing thoroughly with soap and water or using an alcohol-based hand sanitizer
  3. Shower regularly
  4. Avoid contact with other people's wounds or bandages
  5. Avoid sharing personal items such as towels, soaps, or razors

Laundry Management

- Use appropriate PPE to protect hands, arms and clothing when handling soiled laundry
- If the laundry is wet or saturated, bag it in an impervious leak-proof bag
- Separate cleaned laundry from soiled in transport and storage
- Launder in the hottest possible water with detergent
- dry at the hottest temperature the clothing will stand until completely dry
- Use a pre-wash or extra rinse cycle on clothes that have blood or pus on them

Standard Precautions

- Previously called Universal Precautions
- Assumes blood and body fluids from any patient is considered infectious
- Recommends PPE and other infection control practices to prevent transmission
- Decisions about PPE should be determined by type of interaction with the patient
  - Gloves
  - Gowns
  - Mask and Goggles or Face Shield (Face/Eye protection)

Prevention and Control

- HIV infected?
  - May be at increased risk for infection once colonized
  - Follow the same prevention steps

Once MRSA Infected, Prevent the Spread

- Cover the wound
- Clean the hands
- Do not share personal items (towels, soap, razor, tweezers, clothing)
- Notify new or additional healthcare providers of the history of MRSA

What Hasn't Worked

- Nasal culturing in the absence of an outbreak
- Decolonization in the absence of an outbreak

Key Points to Resistance Problem

- Inappropriate use of antibiotics leads to more organisms resistant to those drugs (i.e. vancomycin)
- Inadequate infection control allows for the transmission of organisms both from infected and colonized patients
- Inappropriate treatment of colonization instead of only infection drives organisms toward resistance
- Under use of vaccines (i.e. PCV/PPV, influenza) allows for more 1° and 2° bacterial infections and the need to use antibiotics to treat them

Infection Prevention and Control

- Appropriate cultures and treatment regimens for infections
- Judicious use of antimicrobials
- Proper wound care and containment of drainage
- Appropriate barrier precautions (gloves, and mask, gown, eye shield when necessary) – Standard Precautions Always!
- WASH HANDS !!! (Soap or Alcohol-based rubs)
- Appropriate disinfection of equipment and environment (follow directions precisely)
- MRSA: cohort patients, standard↔contact precautions

Conclusion

- Antimicrobial resistance is a problem that is here to stay!
- To slow the process we need appropriate use of antimicrobials and adequate infection control.
- To prevent the spread we need reliable surveillance data:
  - Proficient identification and susceptibility testing
  - Comprehensive data collection
  - Vigilant resistance monitoring in facilities
  - Dedicated statewide participation & reporting to MDCH (ICPs, HCPs, Labs, LHDs)

Resources

- Michigan Department of Corrections Bureau of Health Care Services "Guidelines for the Management of Antibiotic-Resistant Organisms" July 2004
- Bureau of Prisons Clinical Practice Guidelines for the Management of MRSA Infection, October 2003

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MRSA