Prevalence of methicillin sensitive (MSSA) and resistant staphylococcus aureus (MRSA) transmission in a correctional environment.

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Prevalence of Methicillin Sensitive (MSSA) and Resistant Staphylococcus aureus (MRSA) in a Correctional Environment. Nina T. Harawa, MPH, PhD
Charles R. Drew University of Medicine and Science and Los Angeles Sheriff’s Department, Los Angeles, CA

Background

- Community-acquired MRSA infection is a growing problem in a variety of institutional settings.
- Los Angeles County has documented outbreaks in nurseries, football teams, the LASD jail facilities, and among homosexual men.
- Outbreaks have also been documented in jails and prisons around the nation.
- The LASD jail outbreak was among the first and remains the largest documented community-acquired MRSA epidemic in the United States.
- Over 7,000 new MRSA cases have been identified among LASD inmates since 2001.
- In 2005, a mean of 267 inmates were newly diagnosed each month.
- A significant, but not well-documented number of LASD jail staff have been infected with MRSA.
- It is not known whether these infections were acquired while working at the jail.
- Control measures implemented or tested in LASD and other correctional facilities include:
  - Increased shower/soap access
  - Education of inmates and staff
  - Regular, ongoing disinfection of surfaces
  - Chlorhexidine showers
  - Corolling and empirical treatment of cases
  - Evaluation of potential case contacts and environment cleanup
  - Increased laundry exchange
- No correctional setting is known to have permanently eradicated MRSA through these control measures.
- Some facilities document little-to-no reduction in MRSA incidence following implementation of control measures.

Methods

- All specimens were collected and cultured in January 2006 using dry sterile swabs with Amies gel medium.
- Specimens were stored at room temperature and plated for cultures within 48 hours.
- Specimens were collected using dry rather than moistened swabs.
- Given the seasonality of MRSA infections, may expect more positive cultures during summer months.

Findings from Environmental Sampling

- Nine-positive culture specimens were identified - 6 MSSA-positive and 3 MRSA-positive.
- Positive specimens were located on the following surfaces:
  - Telephones, vending machine buttons, a sink, a table, a toilet, and a clinic gurney.
- All specimens were collected and cultured in January 2006 using dry sterile swabs with Amies gel medium:
  - 2 MRSA-positive and one MSSA-positive specimen came from telephones.
- 74 cultures samples were obtained from inmate and deputy areas in two facilities.
- 18 culture specimens were obtained from inmate living areas in Twin Tower 2*
- 118 culture specimens were obtained from medical, housing, work, movement, and dining areas.
- Outbreaks have also been documented in jails and prisons around the nation.
- The LASD jail outbreak was among the first and remains the largest documented community-acquired MRSA epidemic.

Epidemiology of MRSA Skin and Soft Tissue Infections (SSTIs) among LASD Inmates

- Staphylococcus aureus isolation and identification and antibiotic susceptibility testing was performed according to routine standard laboratory operational procedures.
- 118 culture specimens were obtained from medical, housing, work, movement, and dining areas.
- 74 cultures samples were obtained from inmate and deputy areas in two facilities.
- All specimens were cultured to rule out Staphylococcus aureus and tested for antibiotic susceptibilities.
- Prevalence and 95% continuity-corrected exact confidence intervals were calculated.

Objectives

- Environmental contamination appears to play an important role in transmission of hospital-acquired MRSA (HA-MRSA).
- The role of environmental contamination in CA-MRSA transmission is unclear. This information is needed to target resources for disease control.
- We examined MRSA culture from various high-touch areas in four LASD jail facilities with endemic MRSA in a preliminary effort to examine the role of environmental contamination in the transmission of CA-MRSA in a correctional setting.
- Increased shower/soap access
- Education of inmates and staff
- Regular, ongoing disinfection of surfaces
- Chlorhexidine showers
- Corolling and empirical treatment of cases
- Evaluation of potential case contacts and environment cleanup
- Increased laundry exchange
- No correctional setting is known to have permanently eradicated MRSA through these control measures.
- Some facilities document little-to-no reduction in MRSA incidence following implementation of control measures.

Limitations

- Results are based on a small number of culture specimens from each area.
- Specimens collected during the winter.
- Given the seasonality of MRSA infections, may expect more positive cultures during summer months.
- No genetic testing to ensure that all positive specimens were the community-acquired strain of MRSA (SCCmec type IV).
- Specimens collected using dry rather than moistened swabs.
- Moistened swabs more likely to produce a true picture of prevalence in the environment & yield a higher prevalence.
- Given that individuals generally interact with surfaces with dry skin, dry swabs may provide a better picture of the likelihood of transmission from the jail environment to uninfected individuals.

Conclusions

- The distribution of MRSA infection on inmates’ bodies is consistent with spread through either environmental surfaces or person-to-person contact.
- These data do not support environmental contamination as a major source of MRSA transmission in LASD jails.
- We examined MRSA culture from various high-touch areas in four LASD jail facilities with endemic MRSA in a preliminary effort to examine the role of environmental contamination in the transmission of CA-MRSA in a correctional setting.

Distribution of MRSA Infections by Wound Site among 2005 Inmate Cases

- 65% of wounds occur on areas not generally covered by clothing including head, neck, legs, feet, hands, and arms.
- 31% of wounds occur on areas partially covered by clothing including hips, buttocks, groin, back, abdomen, chest, and axilla.

References