Daily Chlorhexidine Bathing in General Hospital Units – Results of the ABATE Infection Trial (Active BAThing to Eliminate Infection)

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Accessibility
998. Utility of Routine Genomic Sequencing for Infection Control Surveillance
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Session: 134. Where Did That Come From? Transmission Risks in Healthcare
Friday, October 6, 2017: 10:30 AM

Background. Recent work indicates that comprehensive genomic sequencing can be a highly effective tool in defining the transmission of microbial pathogens. We have studied the utility of the routine use of genomic sequencing for infection control surveil- lance in an academic medical center.

Methods. The genomes of inpatient and emergency department isolates of Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae, and Enterococcus faecium were sequenced. Within each species, single-nucleotide polymor-phisms (SNP) were identified in the core genome for all isolates using alignment-based methods. The number of SNP differences between isolate pairs was determined and used, in combination with the patient's electronic medical records to identify potential transmission events.

Results. Between September 2016 and March 2017, 388 S. aureus, 66 P. aerugi-nosa, 48 K. pneumoniae, and 29 E. faecium isolates were sequenced from 573 patients. There was variation in the distribution of SNP differences between intrapatient iso-lates for the four pathogens; with the least variability for E. faecium and greatest for P. aeruginosa. The majority of the bacterial isolates from separate patients appeared to be genetically unique exhibiting marked SNP differences from other isolates. There were 19 sets of isolates where the SNP variation between interpatient isolates was either comparable to that of intrapatient variation (12) and suggestive of recent transmission events, or with SNP variation somewhat greater than the intrapatient SNP variation (7) suggesting relative relatedness. Only one of the highly related sets had been previously identified by standard infection control surveillance. Likely transmissions appeared to have occurred both in the inpatient and outpatient settings, and the transmission routes were not always apparent.

Conclusion. The routine use of genomic sequencing analysis identified previously unappreciated likely transmission events within the institution's patient population that are of relevance to infection control surveillance. This capacity should significantly enhance our understanding of the epidemiology of hospital acquired infections, and assist in developing and implementing new prevention strategies.

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999. Invasive Mycobacterium abscessus Infection after Cardiac Surgery: Epidemiology and Clinical Outcomes
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Session: 134. Where Did That Come From? Transmission Risks in Healthcare
Friday, October 6, 2017: 10:30 AM

Background. We recently mitigated a clonal outbreak of Mycobacterium absc-esus, including a large cluster of patients who developed invasive infection after expo- sure to heater-cooler units (HCU) during cardiac surgery. Recent studies have described a small number of Mycobacterium chimaera infections linked to open-heart surgery; however, little is known about the epidemiology and clinical courses of cardiac sur-gery patients with invasive infection from rapidly-growing mycobacteria, such as M. abscessus.

Methods. We retrospectively collected clinical data from all patients who under-went cardiac surgery at our hospital and had positive cultures for M. abscessus from 2013 to 2016. We excluded heart transplant recipients and patients who at time of diagnosis had ventilator assist devices. We analyzed patient characteristics, antibiotic treatment courses, surgical interventions, and clinical outcomes.

Results. Nine cardiac surgery patients who met the case definition developed culture-proven invasive infection from M. abscessus (Figure 1). Seven (78%) infec-tions occurred after surgeries that included valve replacement. Median time from suspected inoculation in the operating room to first positive culture was 49 days (interquartile range, 38–115 days). Seven (78%) patients had bloodstream infections and six (67%) patients had sternal wound infections. Six (67%) patients develop-ed disseminated disease with infection at multiple sites. All patients received combination antimicrobial therapy. The most common major regimen (n = 6) was imipenem, amikacin, and tigecycline. Four (44%) patients experienced thera-py-limiting antibiotic toxicities (Figure 2). Seven (78%) patients were well enough to undergo at least one surgical debridement. Five (56%) patients stopped therapy due to presumed cure, but four (44%) patients had deaths attributable to M. abscessus infection.

Conclusion. Invasive M. abscessus infection after cardiac surgery was associated with high morbidity and mortality. Most patients underwent surgical debridement and received prolonged three-drug antimicrobial therapy, which was complicated by numerous antibiotic toxicities. Treatment cured five patients, but four patients died from mycobacterial disease.

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1000. Daily Chlorhexidine Bathing in General Hospital Units – Results of the ABATE Infection Trial (Active BAThing to Eliminate Infection)

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Session: 134. Where Did That Come From? Transmission Risks in Healthcare
Friday, October 6, 2017: 10:30 AM

Background. Universal decolonization with daily chlorhexidine (CHG) bathing with and without nasal decolonization has significantly reduced positive MRSA clinical cultures and bloodstream infections in adult ICUs in several clinical trials. We
evaluated whether decolonization was similarly effective in a lower risk hospitalized population.

Methods. We conducted a 2 arm cluster-randomized trial involving a 1-year baseline period (April 2013–March 2014) and a 21-month intervention period (June 2014–February 2016). All noncritical care units in a hospital were assigned to the same strategy. These were (1) Routine Care: routine bathing product and frequency and (2) Decolonization: CHG for routine daily bathing (2% leave-on CHG) or showering (4% rinse-off CHG) for all patients plus murpoxrin for 5 days for known MRSA. Universal ICU decolonization was in place in both arms by September 2013. Differences between the arms in the outcomes between the baseline and intervention periods were assessed with proportional hazards models, using shared frailties to account for clustering by hospital. The primary analysis was as-randomized and unadjusted. Primary outcome was any MRSA or VRE clinical isolate attributable to the unit. Secondary outcome was all-cause bloodstream infections. Additional analyses adjusted for age, gender, race, Medicaid insurance, surgery, and comorbidities.

Results. We randomized 53 hospitals in 15 states. There were 194 adult units with 189,616 admissions in the baseline period and 340,350 in the intervention period. Common unit types included mixed medical surgical (30%), cardiac (20%), step-down (11%), medical (10%), surgical (10%), and oncology (4%). There were no significant differences between arms in the relative hazards for intervention vs. baseline for either outcome (Table and Figure). Adjusted analyses yielded similar results.

Table 1. Event Rates and Model Results for the ABATE Infection Trial

| Strategy | PRIMARY OUTCOME | SECONDARY OUTCOME |
|----------|----------------|------------------|
|          | Unit-Attributable MRSAs-VRE Clinical Cultures | Unit-Attributable Bloodstream Infections |
|          | Outcome | Outcome |
|          | Baseline | Intervention | HR² | P-value³ | Baseline | Intervention | HR² | P-value³ |
| Routine Care | 2.4 | 2.1 | 0.87 (0.79–0.95) | 0.16 |
| Decolonization | 2.2 | 1.7 | 0.79 (0.73–0.87) | 0.16 |
| Explanation: * Adjusted for hazard ratio of unadjusted proportional hazard model estimates are not equal to ratio of survival differences between the baseline and intervention periods. ** P-value for the null hypothesis that the hazard ratio in each treatment arm is equal.***

Conclusion. Universal daily CHG bathing or showering plus targeted murpoxrin for MRSA+ patients in non-critical care units did not reduce the combination of positive MRSA and VRE clinical cultures or bloodstream infections due to all pathogens. Further analyses to assess for any differential effects in high-risk subpopulations will be important.

Disclosures. S. S. Huang, Sage Products: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributing product (no contribution in submitted abstract). Participating healthcare facilities in my studies received contributing product; Xitrimum Laboratories: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributing product (no contribution in submitted abstract), Participating healthcare facilities in my studies received contributing product; Molnlycke: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributing product; E. Septimus, Sage Products: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributing product; Xitrimum Laboratories: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributing product (no contribution in submitted abstract), Participating healthcare facilities in my studies received contributing product; Molnlycke: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributing product; K. Kleinman, Sage Products: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributing product; Xitrimum Laboratories: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributing product (no contribution in submitted abstract).

References: 1. **Key Figures:**

- **Primary Figure:**
  - Figure 1. Group-specific hazard ratios (HRs) and 95% confidence intervals (vertical lines) for trial outcomes. Bubble plots of HRs from individual hospitals relative to their group effects are shown. Bubble size indicates relative number of patients contributing data.

- **Table:** Table 1. Event Rates and Model Results for the ABATE Infection Trial.

- **Conclusion:** Universal daily CHG bathing or showering plus targeted murpoxrin for MRSA+ patients in non-critical care units did not reduce the combination of positive MRSA and VRE clinical cultures or bloodstream infections due to all pathogens. Further analyses to assess for any differential effects in high-risk subpopulations will be important. This study was supported by funding from Sage Products, Clorox, and Molnlycke. The authors have no financial disclosures to report.

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1001. A Single Dose Monoclonal Antibody (mAb) Immunophrophaxis Strategy to Prevent RSV Disease in All Infants: Results of the First Infant Study with MEDI8897
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Session: 135. PIDS Featured Abstracts
Friday, October 6, 2017: 10:30 AM

Background. RSV is the most common cause of lower respiratory tract infection (LRTI) among infants making prevention of RSV disease a public health priority. A significant unmet need exists for RSV prevention in healthy infants. Our goal is to develop a mAb with an extended half-life (1/2) capable of protecting infants for an entire RSV season by using a single intramuscular (IM) dose. This study was conducted to evaluate the safety profile, pharmacokinetics (PK), RSV neutralizing antibody titers, and anti-drug antibody (ADA) responses for MEDI8897 in healthy preterm infants born at ≥32 weeks gestational age.

Methods. Infants were randomized 4:1 to receive a single IM injection of MEDI8897 10 mg (n = 8), 25 mg (n = 31), 50 mg (n = 32) or placebo (n = 18) and followed for 360 days. Enrollment occurred during the 2,015 RSV seasons in the US, South America, and Chile. Blood was collected at multiple timepoints. Infants who met criteria for a medically-attended (MA) LRTI had nasal swabs obtained for RSV testing by RT-PCR.

Results. A total of 85/89 (95.3%) infants completed the study. Adverse events (AEs) were reported in 17/18 (94.4%) placebo and 66/71 (93.0%) MEDI8897 recipients. Five serious AEs (three LRTIs, one febrile seizure) were reported in three MEDI8897 recipients. No events were consistent with hypersensitivity reactions. The estimated MEDI8897 serum t1/2 ranged from 62.5 to 72.9 days. On day 151, 87% of the infants who received the 50 mg dose of MEDI8897 had serum concentrations above the target EC50 level of 6.8 mg/mL and 93.3% showed a ≥3-fold rise from baseline in serum anti-RSV neutralizing antibody titer. ADA was detected in 28.2% of MEDI8897 recipients, but when present was not associated with any safety findings. ADA was detected at day 361 only in 26.3% of subgroups. MA-LRTI was reported in 5 (7%) MEDI8897 recipients through 150 days after dosing. The one subject with an MA-LRTI caused by RSV had received a 10 mg dose of MEDI8897.

Conclusion. In healthy preterm infants, the safety profile of MEDI8897 was favorable. The extended t1/2 of MEDI8897 with the corresponding increase in RSV neutralizing antibody protection was confirmed and supports protection from RSV disease during a typical 5-month season with a single 50 mg IM dose.

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1684. Obesity Following Antiretroviral Therapy (ART) Initiation is Common and Influenced by Both Traditional and HIV-/ART-Specific Risk Factors
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Session: 188. HIV: Modern ART
Friday, October 6, 2017: 2:00 PM

Background. Weight gain commonly occurs among HIV-infected (HIV+) adults initiating modern ART regimens, and obesity is increasingly reported in this population. However, data regarding specific risk factors for obesity development after ART initiation are conflicting.

Methods. We retrospectively analyzed data from a cohort of HIV+ adults who initiated ART between January 1, 2000 and December 31, 2015 in Rio de Janeiro, Brazil. Body mass index (BMI) was assessed at ART initiation. Participants who were non-obese (BMI < 30 kg/m²) at baseline and had ≥90 days of ART exposure were followed for development of obesity. Participants were censored at the time of obesity diagnosis or at end of follow-up (defined as death, loss to follow-up, end of study period or 2 years after their last weight measurement). Incidence rates were estimated using Poisson regression models and risk factor assessment was calculated using Cox regression models accounting for death and loss to follow-up as competing risks.

Results. Participants (n = 1,794) were 61.3% male, 48.7% white, and 36.3% of the participants gained weight, 44% increased their BMI category and 18% developed obesity. Median BMI category distribution was: underweight 14%, normal weight 56%, overweight 22% and obese 8%. Of the 1,567 non-obese participants followed after ART initiation, 76% gained weight, 44% increased their BMI category and 18% developed obesity. Median

Disclosures.