Table 1: Antimicrobial Susceptibility for SA Isolates by Drug Resistance Category (%)

| Ciprofloxacin | Clindamycin | Erythromycin | Gentamicin | Levofloxacin | Linezolid | Ornidazole | Quinupristin-Dalfopristin | Penicillin G | Trimethoprim Sulfamethoxazole | Timentin | Tetracycline | Tigecycline |
|---------------|-------------|--------------|------------|-------------|-----------|------------|-------------------------|-------------|-------------------------------|----------|-------------|-----------|
| VISA          |             |              | 81         | 63          | 79        | 64         | 62                      | 68          | 80                           | 71       | 100         | 100      |
| VRSA          |             |              | 87         | 83          | 79        | 64         | 62                      | 68          | 80                           | 71       | 100         | 100      |

Figure 2. VRSA samples in Metropolitan SD based on income level of communities.

Conclusion. In this nationwide sample, we found an alarming number of VISA and VRSA. Most cases were in metropolitan SD with lower income communities carrying a higher case burden. Linezolid and TMP-SMX retain activity against VISA and VRSA in the DR. The rise of vancomycin resistance in developing countries and the disproportionate burden on communities of low income is concerning and requires further study. Infection control measures and antimicrobial stewardship interventions may help prevent further spread of resistant strains.

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1216. Cost-Effectiveness of Penicillin Skin Allergy Testing in Methicillin-Sensitive Staphylococcus aureus (MSSA) Bacteremia

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Session: 137. Healthcare Epidemiology: MSSA, MRSA and Other Gram Positive Infections

Friday, October 5, 2018: 12:30 PM

Background. β-Lactams remain the gold standard for treatment of MSSA bacteremia due to superior outcomes compared with vancomycin. Approximately nine in 10 patients receiving penicillin skin testing (PST) will be de-labeled of a penicillin allergy and able to receive a β-lactam antibiotic. The study aims to evaluate the cost-effectiveness of penicillin allergy confirmation during acute care admission for methicillin-sensitive staphylococcus aureus (MSSA) bacteremia through a PST service.

Methods. A decision tree analysis was used to compare a PST intervention in patients with a registered penicillin allergy during an inpatient admission for MSSA bacteremia vs. usual care (No PST). The model was created from the health sector perspective with a 1-year time horizon. Patients with a penicillin allergy label were expected to receive vancomycin while patients with no penicillin allergy were expected to receive cefazolin. Potential inpatient, outpatient, and adverse reaction cost were considered in all arms of the model. The effects were measured in quality adjusted life years (QALY) and were calculated for patients who were cured, hospitalized, experienced severe adverse events, or died from MSSA infection.

Results. Patients who received PST services had a mean yearly cost of $12,802, mean quality adjusted life years (QALY) of 0.70, and mean cost/QALY of $18,311. The comparator group not receiving PST services had a mean yearly cost of $12,264, mean quality adjusted life years (QALY) of 0.64, and mean cost/QALY of $19,192. The model produced a final base case ICER of $8,966/QALY for receiving a PST during a hospital admission for the treatment of methicillin-sensitive staphylococcus aureus (MSSA) bacteremia.

Conclusion. Penicillin allergy confirmation through PST services was cost-effective for patients with a reported penicillin allergy admitted for MSSA bacteremia. Additional research to determine potential benefits of PST services beyond one year could further improve the cost-effectiveness of this intervention.

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1217. Staphylococcus Protein A (spa) Typing Demonstrates Genetic Heterogeneity of Methicillin-Susceptible Staphylococcus aureus (MSSA) in a Neonatal Intensive Care Unit (NICU)

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Session: 137. Healthcare Epidemiology: MSSA, MRSA and Other Gram Positive Infections

Friday, October 5, 2018: 12:30 PM

Background. In the NICU, MSSA is a more prevalent pathogen than MRSA, but optimal infection prevention and control strategies for MSSA are not yet well understood. There are likely multiple routes of MSSA acquisition given its role as normal flora and its detection in the anovaginal tract of pregnant women. We describe the molecular epidemiology of MSSA in our NICU during a yearlong surveillance effort.

Methods. Included infants were hospitalized in a university-affiliated level III-IV NICU from January to December 2017 (1032 admissions) and had positive clinical and/or surveillance cultures for MSSA. Infants admitted at ≥7 days of age were screened for MSSA colonization by culturing the anterior nares and three skin sites. All infants in the NICU were screened twice monthly. Spa typing was performed to genetically characterize isolates.

Results. During the study period, MSSA was identified in 187 infants (18 at admission, 145 by twice monthly surveillance, and 24 from clinical cultures). In all, 269 MSSA isolates (245 surveillance and 24 clinical isolates) from 166 infants were spa typed. Sixty-two MSSA spa types were identified; 31 (50%) were each detected in only one infant. The incidence of the nine most common spa types is shown (Figure 1); t279 (13%), t1451 (8%), and t1445 (6%) had the highest incidence. t1451 and t571 belong to ST398, a common MSSA clone in the local community. The epidemiology of spa types varied; e.g., incident cases of t279 was detected in 10 months, t1451 was detected in 6 months and t148 in 3 months. Among the 14 sets of twins and triplets with MSSA isolates, 12 (86%) shared the same spa type as their sibling(s). Of the 58 infants with >1 MSSA isolate, 12 (21%) acquired new spa-types. No spa type(s) predominated in the 19 episodes of invasive infections. In 6 infants with both colonizing and invasive isolates, colonizing and invasive isolates were the same spa type(s) in 5.

Conclusion. Spa typing demonstrated that MSSA isolates in our NICU exhibited substantial genetic heterogeneity. While these data do not elucidate acquisition patterns, the biggest infants are acquiring MSSA from multiple sources, likely including family members and the local community. Ongoing sequencing studies are examining common spa types to further understand transmission dynamics.

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1218. Retapamulin as a Potential Decolonizing Agent: Activity against Mupirocin-Resistant Stains From Pediatric Patients With Methicillin-Resistant Staphylococcus aureus Infection

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Session: 137. Healthcare Epidemiology: MSSA, MRSA and Other Gram Positive Infections

Friday, October 5, 2018: 12:30 PM
Background. Controlling methicillin-resistant Staphylococcus aureus (MRSA) colonization is a common strategy to prevent transmission and recurrent infection. Standard decolonization regimens include nasal application of mupirocin ointment; however, increasing rates of mupirocin-resistance (Mup-R) have been noted globally. At our institution there has been an increase in community-acquired MRSA (CA-MRSA) infections among patients living in Brooklyn, New York. A genotypic geographic cluster of a break clone of the CA-MRSA strain USA 300 with a high rate (>85%) of mupirocin resistance, mediated by the plasmid borne mupA gene, was identified prompting investigation into an alternative decolonizing agent. We sought to investigate retapamulin, a topical pleuromutilin antibiotic, which has been shown to be effective against S. aureus with in vitro and in vivo activity against MRSA and a low propensity to develop resistance. 

Methods. Broth microdilution was used to determine the minimum inhibitory concentrations (MIC) of retapamulin against 53 Mup-R MRSA isolates collected from pediatric patients (aged 0-17 months) presenting to our institution over an 18 month period with clinical MRSA infection. Susceptibility defined as ≤0.5 mg/L susceptible (EUCAST). Whole genome sequence data were analyzed for the presence of rpfC and cfr gene mutations known to confer resistance to retapamulin.

Results. All 53 isolates were susceptible to retapamulin, 48/53 (92%) were strains were inhibited at MIC 0.25 mg/L, 2/53 (4%) at MIC 0.125 mg/L and 2/53 (4%) at MIC 0.06 mg/L. DNA sequence analysis showed that one isolate had a first-step mutation in the rpfC gene, but it was not associated with reduced phenotypic susceptibility to retapamulin, as the MIC of that isolate was 0.25 mg/L.

Conclusion. Retapamulin demonstrated excellent in vitro activity against a genotypic type of Mup-R isolates from pediatric patients presenting to our institution with MRSA infection. These data suggest that retapamulin may be a promising alternative decolonization therapy for MRSA and a viable option to prevent the spread of mupirocin-resistant MRSA clones. Further research includes an ongoing randomized, placebo-controlled trial testing the in vivo efficacy of retapamulin as a nasal and perirectal decolonizing agent in children.

1219. Increasing Methicillin Resistance of Staphylococcus lugdunensis in a Tertiary Care Community Hospital in Japan
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Session: 137: Healthcare Epidemiology: MSSA, MRSA and Other Gram Positive Infections
Friday, October 5, 2018: 12:30 PM

Background. Staphylococcus lugdunensis, a coagulase-negative staphylococcus, has virulence factors similar to that of Staphylococcus aureus. Methicillin resistance and presence of mecA gene are not common in S. lugdunensis in many parts of the world. Recently, higher prevalence of methicillin-resistant S. lugdunensis is reported from Taiwan and Japan. We describe the change in methicillin resistance of S. lugdunensis in a tertiary care community hospital in Sapporo, Japan.

Methods. We performed a retrospective study of S. lugdunensis, isolated from inpatients and outpatients at our hospital from 2008 to 2017. Rate of methicillin resistance of the first 5 years from 2008 to 2012, and that of the second 5 years from 2013 to 2017 were compared. Risk factors of methicillin resistance were also evaluated. Phenotypic detection of methicillin resistance was identified using broth microdilution by VITEK two system (bioMérieux).

Results. A total of 369 cases of S. lugdunensis were detected during the study period. Of all cases, 228 (61.8%) were men, and 177 (48.0%) were hospitalized. Twenty-one isolates (5.7%) were positive in blood culture, 216 (58.6%) were positive in cultures of skin and soft tissue. Methicillin-resistant strains were found in 43 (31.6%) of 136 isolates from 2008 to 2012, and in 108 (46.4%) of 233 from 2013 to 2017 (OR 1.87; 95% CI 1.20–2.91; P = 0.006). Of patients with methicillin-resistant S. lugdunensis, 105 cases (69.5%) were hospitalized (P = 0.001).

Conclusion. In our hospital, methicillin-resistant S. lugdunensis is increasing over the 10 years. Further research is needed to assess trend of methicillin resistance of S. lugdunensis in other healthcare facilities and countries.

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1220. Impact of Mandatory Infectious Diseases Consultation on the Use of Core Measures and Mortality in Staphylococcus aureus Bacteremia (SAB) at an Academic Medical Center
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Session: 137: Healthcare Epidemiology: MSSA, MRSA and Other Gram Positive Infections
Friday, October 5, 2018: 12:30 PM

Background. Multiple studies have shown that Infectious Diseases (ID) consultation on SAB improves adherence to guideline-based care for patients with SAB, and decreases mortality. Data from a prior retrospective study done at Hahnemann University Hospital showed that ID consultation improved the use of guideline-based core measures for SAB management. Based on these data, a mandatory ID consultation was established at our institution in November 2016.

Methods. A retrospective, observational study was conducted to evaluate patient characteristics, adherence to core measures for SAB, and in hospital mortality. All patients with at least one documented blood culture positive for S. aureus were stratified into two groups: pre-mandatory consult (January 1, 2014–November 1, 2016) and post mandatory consult (November 2, 2016–February 1, 2018).

Results. Three hundred seventy-three discrete episodes of SAB were included in the final analysis, 238 episodes before mandatory consult, and 135 episodes after the mandatory consult policy was enacted. Mandatory consultation significantly improved the use of the following core measures for SAB: surveillance blood cultures (87.7% pre vs. 99.2% post, P < 0.001), early targeted antimicrobial therapy with nitricillin or cefazolin in MSSA (71.7% vs. 88.6%, P < 0.001), and appropriateness of final antibiotic choice (80.2% vs. 95.2%, P < 0.001). In addition, in-hospital mortality (15.4% vs. 6.2%, P = 0.011), and infection-related mortality (14.3% vs. 5.6%, P < 0.01) were found to be statistically significantly lower in the post mandatory consultation patients.

Conclusion. Implementation of a mandatory ID consultation for patients with SAB at our institution was associated with increased adherence to guideline-based care measures for management of SAB, and decreased in-hospital and infection-related mortality. Our results suggest that mandatory ID consultation for SAB should be considered at all institutions.

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