Results. Most patients (67/7) had methicillin-sensitive S. aureus (MSSA) and one patient had S. epidermidis infection. Three patients had spinal fusion hardware infection, one patient had hardware-associated spinal osteomyelitis/diskitis with epidural abscess, two patients had prostatic joint infection, and one patient had MSSA bacteremia with left ventricular assistance device involvement. All patients except one underwent surgical management prior to starting rifabutin. Infection recurrence was noted in one of seven patients who required surgical washout. Adverse events were uncommon (n=1 treatment-related nausea, n=1 leukopenia).

Conclusion. This small case series suggests favorable outcomes with use of rifabutin instead of rifampin for staphylococcal infections with prostatic involvement.

Disclosures. Sandra B. Nelson, MD, UpToDate (Other Financial or Material Support, author)

794. The Role of the Environment in Healthcare-associated Transmission of Vancomycin Resistant Enterococcus: A Proof of Concept Study
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Session: P-40. HA1: Gram-positives (MSSA, MSSA, VRE)

Background. Transmission of Vancomycin Resistant Enterococcus (VRE) from environment to patient and patient to patient can both occur in healthcare settings. Due to the COVID-19 pandemic, a cohort of exposed patients on an inpatient unit with an extensive VRE outbreak needed to switch physical locations with a non-exposed patient population. By comparing outcomes of both cohorts, we aimed to determine the role of the physical environment (both direct and indirect contact) as compared to the patient population, in ongoing VRE transmission.

Methods. From 10 March to 21 April 2021, 41 new nosocomial acquisitions of VRE were detected as part of a VRE outbreak on a 34-bed acute care unit. Prior to the switch of units, extensive cleaning of the unit was conducted including electrostatic adjuncts to standard cleaning and environmental swabbing for VRE yielded no positive surfaces. The exposed cohort included 3 of 30 patients with VRE while the non-exposed cohort had 0 of 28 VRE positive patients based on prevalence testing on 21 April 2021. Following the physical relocation of both cohorts on 22 April, 2021, prospective VRE screening was performed on both units for one month including on admission, discharge and weekly prevalence screening. Hand hygiene compliance rates on both units was measured using group electronic monitoring.

Results. Figure 1 depicts the timeline and number of VRE cases before and after the unit switch. Following relocation of the VRE exposed cohort to the new unit, no further VRE transmission was detected (0/235 VRE screens; 0 VRE cases per 1000 patient days). Conversely, there were new VRE transmissions (3/99 VRE screens, 5 VRE cases per 1000 patient days) in the non-exposed cohort. When the units resumed their original location, one additional case of VRE was identified in the exposed cohort upon return to their original location. These transmissions occurred despite HH compliance of 94% (141,610/150,706) during the entire study period on the outbreak unit, which was consistently higher than on the non-outbreak unit (141,589/227,136, 62%).

Conclusion. The environmental reservoir for VRE may be more important in transmission than the patient reservoir. These findings underscore the importance of environmental cleaning to contain VRE outbreaks.

Disclosures. All Authors: No reported disclosures

795. A Bayesian Spatial-temporal Modelling Approach for Prevalence Estimation of a VRE Outbreak in a Tertiary Care Hospital
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Session: P-40. HA1: Gram-positives (MSSA, MSSA, VRE)

Background. There was a nosocomial outbreak of vancomycin-resistant enterococci (VRE) in our hospital group from 2018-19. The goals of the study were to describe the prevalence trajectory and explore risk factors associated with putative room colonization during the outbreak.

Methods. We performed a room centric analysis of 12 floors (floors F to R, 264 rooms) of the main bed tower of the hospital, including data on 37,458 patients (23,050 person weeks) over the 104 week period. Patients were assumed to be colonized in the week prior to their first positive test, and thereafter throughout the remainder of their stay until discharge. Poisson Bayesian Hierarchical models were fitted to estimate prevalence per room, including both spatial (conditional autoregressive) and temporal (random walk) random effects terms. Model M1 estimated prevalence for each floor and then used meta-analysis to combine the estimates, whereas model M2 estimated prevalence for "all-floors" simultaneously.

Results. The oncology department, where the outbreak was thought to have started, experienced slightly higher prevalence (floors O and R; adjusted incidence rate ratio (aIR) 4.8 [2.6, 8.9], p < 0.001; reference is general medicine; see Figure Panel A), as did both the cardiac surgery (floors G, N; aIR 3.8 [2.6, 7.3], p < 0.001) and abdominal surgery departments (floors H and Q; 3.7 [1.8, 7.6], p < 0.001). There was no discernible difference in prevalence between floors with single and multiple department occupancy. Furthermore, departments spread across multiple floors had similar prevalence on all constituent floors – perhaps indicating transmission by people or devices moving between floors.

The "single floor meta-analysis" model (M1) more closely followed the estimated trajectory for the crude prevalence, whereas the "all-floors" model (M2) dampened the amplitude of the peaks somewhat, but better estimated periods of low prevalence (Figure Panel B).

Figure: Estimates from the Bayesian Hierarchical Models

Panel A. Random effect prevalence estimates for each floor (from model M2). Panel B. Crude prevalence (black) and estimates from the "single floor meta-analysis" approach (M1, dashed red) with 95% credible intervals shaded (shaded red), and "all-floors" model (M2, blue).

Conclusion. We applied a room centric approach that took into account spatial and temporal dependencies apparent in the nosocomial VRE outbreak. Despite additional complexity, Bayesian Hierarchical Models provide a more flexible platform for studying transmission dynamics and performing hypothesis testing, compared to more traditional methods.

Disclosures. All Authors: No reported disclosures

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