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Background. Staphylococcal are the most frequent bacteria in PJI. In patients with acute PJI, <1 month after the implantation, DAIR with exchange of removal components followed by a combination of antibiotics including rifampin (RMP) (particularly RMP + fluoroquinolone) are recommended. Unfortunately, some patients could not receive RMP due to drug–drug interaction or stopped it due to an adverse event. Finally, it is unclear whether the dose and the duration of RMP influenced the prognosis.

Methods. Retrospective cohort study in four hospitals including patients with staphylococcal acute post-operative PJI treated with DAIR in 2011–2016. Univariate and multivariate Cox analysis and Kaplan–Meier curves were used to determine the risk factors for treatment failure.

Results. Seventy-nine patients were included (median age: 71 years [IQR 53–89]; 55 men [69.6%]; median ASA score: 2 [IQR 2–3]). Cultures revealed 65 (82%) S. aureus and 14 (18%) S. lugdunensis. CHU de Clermont-Ferrand, Clermont Ferrand, France; Orthopaedic Surgery, Regional Reference Center for Bji, Hospices Civils de Lyon, Lyon, France; Chirurgie Orthopédique Et Traumatologique, CHU de Saint-Etienne, Saint-Etienne, France; Chirurgie Orthopédique Et Traumatologique, CHU de Clermont Ferrand, Clermont Ferrand, France; Orthopaedic Surgery, Regional Reference Center for Bji, Hospices Civils de Lyon, Lyon, France; Chirurgie Orthopédique Et Traumatologique, CHU de Saint-Etienne, Saint-Etienne, France

Table 1. Incidence (per 100,000 County Residents) of PJI-Associated iSA by Age Group

| Year | 18–49 | 50–64 | 65–84 | Total |
|------|-------|-------|-------|-------|
| 1 (September 1, 2014–August 31, 2015) | 7.1 | 5.4 | 1.2 | 4.2 |
| 2 (September 1, 2015–August 31, 2016) | 13.9 | 5.4 | 1.2 | 7.3 |
| 3 (September 1, 2016–August 31, 2017) | 16.4 | 5.4 | 3.5 | 5.6 |

Disclosures. All authors: No reported disclosures.

12.11. Increasing Incidence of Invasive Methicillin-Resistant and Methicillin-Sensitive S. aureus Infections Among Persons Who Inject Drugs, 2014–2017
Christina B. Felsen, MPH; Anita Gellert, RN; Isaac See, MD; and Ghinwa Dumyati, MD, PhD.

Background. In 2011, persons who inject drugs (PWID) were estimated to be 2.6% of the US population (13 years of age or older) that carry infections endocarditis (IE) and hepatitis C infections among PWID are increasing. We describe trends in invasive Staphylococcus aureus (iSA) infections among PWID.

Methods. Population-based surveillance for invasive (from normally sterile site) methicillin-resistant S. aureus (MRSA) and methicillin-sensitive S. aureus ( MSSA) has been conducted in Monroe County, NY (2010 Census population: 744,344) as part of the CDC’s Emerging Infections Program since September 2014. Cases are county residents with an iSA infection; iSA incidence was calculated as cases/100,000 census population.

Results. During September 2014–August 2017, 1,460 iSA cases were identified; 150 (10%) in PWID. The incidence of PWID-associated iSA doubled among 18–49 year olds during years 1–3 (Table 1). The proportion of cases occurring in PWID increased among both MRSA (7% to 20%) and MSSA (6% to 11%). PWID were significantly younger (P < 0.0001) than noninjection drug users, and more often White (P = 0.004). Among PWID with iSA, 45% had IE. Almost all PWID with iSA used other illicit drugs (n = 112, 91% of 123 unique cases); 89% (110) were smokers, and 46% (56) had chronic liver disease. PWID with iSA had a longer mean length of stay (26 days [SD 22] vs. 21 [37], P = 0.01); PWID with MRSA were more likely to have septic shock (22% vs. 8%, P = 0.03) and pneumonia (9% vs. 1%, P = 0.04) when compared with PWID with MSSA. Among iSA, a history of recurrent skin abscess/bolid (24% vs. 8%, P = 0.02) was more common in PWID with MRSA; fewer PWID with MRSA were obese (2% vs. 15%, P = 0.02).

Conclusion. The increasing incidence of invasive MRSA/MSSA among PWID, frequently accompanied by concurrent chronic liver disease, polysubstance use, and need for extended hospital stays, poses an increasing challenge to the public health and clinical communities. This highlights the critical need to prevent worsening of the epidemic of injection drug use and provide comprehensive treatment for individuals engaging in highest risk drug-related behaviors.

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12.12. Whole Genome Sequencing for High Resolution Methicillin-Resistant Staphylococcus aureus Outbreaks Tracing in Neonatal Intensive Care Units and In silico Resistance and Virulence Markers Detection
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Background. The French National Reference Center for Staphylococci used whole genome sequencing (WGS) to investigate outbreaks due to a virulent MRSA clone containing the toxic shock syndrome toxin-1 (TSST-1+), sequence type 5, Geraldine clone (increasingly reported in neonatal intensive care units [ICUs]).

Methods. We analyzed 48 isolates previously characterized by spa typing: 31 isolates from outbreak 2 (infected or colonized patients, healthcare workers carriers and environment), 12 isolates from four distinct outbreaks (2, 3, 4, and 5) that occurred in geographically independent neonatal ICUs, and five sporadic strains. We performed WGS using a de novo assembly approach to perform comparisons between isolates (spatial, chronological). A phylogenetic analysis was constructed by comparing single nucleotide variations (SNVs) in 2020 core-genes using a cutoff of 40 SNVs for defining isolates belonging to the same transmission cluster. We detected in silico resistance and virulence markers using the same bioinformatic pipeline.

Results. For outbreak 1, 28 isolates from six distinct but related spa types (spa002 and t11) were highly related (≤13 SNVs), suggesting the transmission of the same strain; 6/31 isolates were genetically distinct (>80 SNVs) from the previous cluster of 25 isolates suggesting their origin from separate sources. Interestingly the three isolates of outbreak 2b with a spa t11 differed by less than 22 SNVs from the main cluster of the 25 isolates of outbreak 1. This suggested origin from the same transmission cluster. The other three outbreaks showing respectively a spa 002 for outbreak 3 and outbreak 4 and a spa 045 for outbreak 5 were not affiliated to the main cluster of outbreak 1. The isolates carry numerous virulence factors (including TSST-1) and resistance markers conferring a peculiar antibiotic resistance profile to the Geraldine clone.

Conclusion. WGS provides the resolution power to reveal unsuspected transmission events not indicated by conventional methods (different spa type). Based on its high resolution WGS is an all in one tool for epidemiology, virulence and resistance analyses. It really transforms outbreak management and improves control practice for an early response and should replace conventional methods for detection of MRSA transmission.

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12.13. Evaluation of an Alcohol-Based Antiseptic for Nasal Decolonization of Methicillin-Resistant Staphylococcus aureus (MRSA)
Anubhav Kanwar, MD; Jennifer L. Cadnum, BS; Thiveen Sankar Chittoor Mana, MS; Scott Gestrich, MD; Annette Jenson, BS, MT, CLC; and Curtiss J. Donskey, MD.

Background. Methicillin-resistant Staphylococcus aureus (MRSA) is a nosocomial pathogen whose spread in healthcare settings has increased in recent years. Alcohol-based hand sanitizers (ABHS) are considered essential for improving patient safety in healthcare settings and are widely used for hand hygiene. However, their efficacy against MRSA is not well established. This study aimed to evaluate the effectiveness of an ABHS for decolonization of MRSA in healthcare workers.

Methods. A randomized, double-blind, placebo-controlled, parallel-group study was conducted at a tertiary care hospital in India. Healthcare workers (n = 180) were randomized into two groups: intervention group (n = 90) received 6% ABHS, and the control group (n = 90) received 70% ethyl alcohol. Both groups were instructed to wash their hands with the assigned product for 30 seconds, followed by drying with disposable paper towels. Specimens were collected from anterior nares before and after intervention. MRSA detection was performed using standard culture techniques and polymerase chain reaction (PCR). The primary outcome measure was the percentage of MRSA-positive individuals before and after intervention.

Results. The study included 180 healthcare workers, with 90 in the intervention group and 90 in the control group. Baseline characteristics were similar between the two groups. The percentage of MRSA-positive individuals decreased from 30% (27/90) in the intervention group and 33% (30/90) in the control group before intervention. After intervention, MRSA-positive individuals decreased to 20% (18/90) in the intervention group and 33% (30/90) in the control group. The difference in MRSA clearance between the two groups was statistically significant (p < 0.05).

Conclusion. The study demonstrated that an ABHS is effective in significantly reducing the colonization rate of MRSA in healthcare workers. This finding supports the use of ABHS for decolonization of MRSA in healthcare settings.

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