Table 2 Invasive Group B Streptococcus infection stratified by body mass index (BMI)

Infectious Syndromes	BMI ≤ 18.5 N = 99	BMI 18.5 – 24.9 N = 884	BMI 25 – 29.9 N = 1300	BMI 30 – 39.9 N = 1880	BMI ≥ 40 N = 798
Osteomyelitis	21 (21%)	186 (21%)	362 (28%)	464 (25%)	118 (15%)
Bacteremia	22 (22%)	219 (25%)	283 (22%)	343 (18%)	121 (15%)
Skin/Soft Tissue Infection	5 (5%)	83 (9%)	189 (15%)	350 (19%)	254 (32%)
Pneumonia	29 (29%)	159 (18%)	154 (12%)	218 (12%)	120 (15%)
Joint Infection	5 (5%)	70 (8%)	128 (10%)	235 (12%)	87 (11%)
Endocarditis	9 (9%)	88 (10%)	107 (8%)	143 (8%)	64 (8%)
Peritonitis	3 (3%)	42 (5%)	26 (2%)	56 (3%)	13 (2%)
Necrotizing Fasciitis	3 (3%)	16 (2%)	32 (2%)	44 (2%)	13 (2%)
Meningitis	2 (2%)	21 (2%)	19 (1%)	27 (1%)	8 (1%)

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467. Antimicrobial Resistance and Molecular Analysis of *Staphylococcus aureus* in Staphylococcal Scalded Skin Syndrome among Children in Korea

Jae Hong Choi, MD, MS[1]; Hyunju Lee, MD, PhD[2] and Eun Hwa Choi, MD, PhD[3]; [1]Jeju National University Hospital, Jeju, Korea, Cheju-do, Republic of Korea; [2]Department of Pediatrics, Seoul National University Bundang Hospital, Seongnam, Korea, Seongnam, Kyonggi-do, Republic of Korea; [3]Seoul National University College of Medicine, Seoul, Seoul-t'ukpyolsi, Republic of Korea

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Background. Staphylococcal scalded skin syndrome (SSSS) is a blistering and desquamative skin disease caused by the exfoliative toxins of *Staphylococcus aureus*. SSSS mainly affects children younger than 5 years of age. Although many countries show a predominance of methicillin-susceptible *S. aureus* (MSSA), recently an increase in cases due to methicillin-resistant *S. aureus* (MRSA) has been reported. We investigated the molecular characteristics of *S. aureus* isolated from the children with SSSS in Korea.

Methods. From January 2010 to December 2017, children clinically diagnosed as SSSS under the age of 5 years were enrolled. Cases from 3 different university hospitals in Korea were included. *S. aureus* isolated from nasal, axillary, or inguinal area of the children were analyzed for multilocus sequence type and exfoliative toxins (*eta, etb*). Medical records were retrospectively reviewed for clinical characteristics and antimicrobial susceptibility patterns of *S. aureus*.

Results. A total of 26 cases were enrolled. The mean age was 2.3 years (range, 0–4.8 years). Twenty-two (84.6%) patients were hospitalized. Skin manifestations were classified as follows; generalized (n = 10, 38.5%), intermediate (n = 11, 42.3%), and abortive (n = 5, 19.2%). Twenty-five isolates (96.2%) were resistant to methicillin and macrolide-resistance was found in 92.3% (n = 24). ST89 (n = 21, 80.8%) was the most prevalent clone, with single clones of ST1, ST5, ST72, ST121, and ST1507. The *eta* gene was detected in 1 (3.8%) MSSA isolate. The *etb* gene was detected in 14 (53.8%) isolates all of which were ST89. All patients were treated with antibiotics, and the mean duration was 8.3 days regardless of the administration route. Nafcillin or first cephalosporin was most commonly prescribed (n = 20, 76.9%), clindamycin was administered in combination in 9 patients (34.6%) and vancomycin in 4 patients (15.4%). Among the 25 MRSA cases, only 6 (24.0%) were treated with susceptible antibiotics. However, there was no difference in treatment duration according to antimicrobial susceptibility (8.43:8.22 days, $P > 0.05$).

Conclusion. The molecular epidemiology of *S. aureus* isolated from the Korean children with SSSS demonstrated the high prevalence of methicillin-resistant ST89 clone that harbors the *etb* gene.

Disclosures. **All authors:** No reported disclosures.

468. Epidemiologic Features of Invasive Methicillin-Resistant *Staphylococcus aureus* and Group A *Streptococcus* Infections among Adults Who Inject Drugs in the San Francisco Bay Area, 2008–2017

Joelle Nadle, MPH[1]; Mirasol Apostol, MPH[1]; Tanya Libby, MPH[1] and Art Reingold, MD[2]; [1]California Emerging Infections Program, Oakland, California; [2]UC Berkeley, Berkeley, California

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Background. Injection drug use has been associated with infection with invasive methicillin-resistant *Staphylococcus aureus* (iMRSA) and invasive group A *Streptococcus* (iGAS). In light of the ongoing opioid epidemic, we sought to describe the epidemiologic features of iGAS and iMRSA infections among persons who inject drugs (PWID) in the San Francisco Bay Area.

Methods. Active, population-based surveillance for iMRSA and iGAS was conducted in three California counties during 2008–2017. We defined a case as recovery of MRSA or GAS from a normally sterile site in a surveillance area resident ≥18 years of age. We collected demographic and clinical information and history of injection drug use (IDU) in the past 12 months. Trends in the incidence of infection were assessed using the Cochran-Armitage test for trend. Odds ratios (OR) and 95% Confidence Intervals (CI) were calculated comparing PWID and non-PWID.

Results. Of the 6,705 iMRSA and 1,691 iGAS cases identified during 2008–2017, 764 (11%) and 241 (14%), respectively, were among PWID. The proportion of iMRSA cases reporting IDU increased from 9.6% in 2008 to 12.9% (P = 0.017) in 2017 (Figure 1); no significant trend was observed for iGAS cases (Figure 2). Among iMRSA and iGAS cases, PWID cases were younger than non-PWID cases (iMRSA median 46 vs. 63 years, $P < 0.0001$; iGAS 41 vs. 57 years, $P < 0.0001$) and were more likely to be homeless (iMRSA OR 8.3, CI 6.7–10.2; iGAS OR 5.4, CI 4.0–7.2), and diagnosed with endocarditis (iMRSA OR 5.9, CI 4.8–7.3; iGAS OR 2.8, CI 1.3–6.4) and internal abscesses (iMRSA OR 4.3, CI 3.5–5.3; iGAS OR 3.4, CI 2.1–5.5) (Table 1). For iMRSA, PWID cases were more likely than non-PWID cases to be community-associated, (OR 2.5, CI 2.1–2.9) and diagnosed with septic arthritis (OR 2.4, CI 1.9–3.0).

Conclusion. The proportion of iMRSA cases reporting IDU significantly increased between 2008 and 2017, in the San Francisco Bay Area. iMRSA and iGAS cases among PWID are younger, more likely to be homeless, and diagnosed with endocarditis and internal abscesses. Prevention measures targeting this younger population who are experiencing homelessness and/or are injecting drugs, may limit severe manifestations of iMRSA and iGAS. These prevention measures should include support of safe injection practices.

Figure 1. iMRSA cases associated with injection drug use - ≥18 years

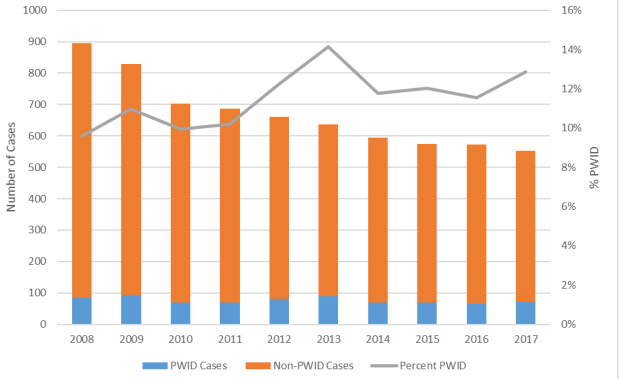

Figure 2. iGAS cases associated with injection drug use - ≥18 years

Table 1. Characteristics of invasive MRSA and GAS infections among persons ≥ 18 years who inject drugs (PWID), 2008-2017

	Invasive MRSA			Invasive GAS		
Characteristics	PWID	non-PWID	OR (95% CI)	PWID	NON-PWID	OR (95% CI)
Homeless	25%	4%	**8.3 (6.7-10.2)**	35%	15%	**5.4 (4.0-7.2)**
Male	62%	64%	0.9 (0.7-1.0)	65%	60%	1.2 (0.9-1.6)
Hospitalized	95%	92%	**1.8 (1.3-2.6)**	96%	94%	1.7 (0.8-3.4)
Outcome - Died	8%	15%	0.5 (0.4-0.6)	6%	10%	0.6 (0.3- 1.0)
Community-associated[a]	42%	22%	**2.5 (2.1-2.9)**			
Endocarditis	21%	4%	**5.9 (4.8-7.3)**	4%	1%	**2.8 (1.3-6.4)**
Abscess not skin	20%	6%	**4.3 (3.5-5.3)**	13%	4%	**3.4 (2.1- 5.5)**
Septic Arthritis	13%	6%	**2.4 (1.9-3.0)**	12%	9%	1.4 (0.9-2.3)
Cellulitis	19%	12%	**1.6 (1.3-2.0)**	55%	46%	**1.4 (1.1-1.9)**
Osteomyelitis	18%	15%	**1.3 (1.1-1.6)**	10%	7%	1.5 (0.9-2.5)
Septic Shock	7%	8%	0.8 (0.6-1.1)	7%	11%	0.6 (0.3- 1.0)
Pneumonia	12%	15%	0.8 (0.6-1.0)	12%	18%	0.6 (0.4-0.9)

[a]Community-associated was defined as specimen collection < 3 days after hospital admission without indication of dialysis, hospitalization, surgery, or long-term care residency in the 12 months preceding culture; and/or the presence of a central venous catheter ≤ 2 days before specimen collection.

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469. Contributions of Infections among Persons Who Inject Drugs to the Changing Incidence of Healthcare-Associated, Community-Onset Methicillin-Resistant *Staphylococcus aureus* Infections, 2009–2017

Kelly A. Jackson, MPH[1]; Runa Hatti. Gokhale, MD, MPH[2]; Joelle Nadle, MPH[3]; Susan Petit, MPH[4]; Susan Ray, MD[5]; Lee Harrison, MD[6]; Ruth Lynfield, MD[7]; Ghinwa Dumyati, MD[8]; William Schaffner, MD[9] and Isaac See, MD[1]; [1]Centers for Disease Control and Prevention, Atlanta, Georgia; [2]CDC, Atlanta, Georgia; [3]California Emerging Infections Program, Oakland, California; [4]Connecticut Department of Public Health, Hartford, Connecticut; [5]Emory University School of Medicine, Atlanta, Georgia; [6]University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania; [7]Minnesota

Department of Health, Saint Paul, Minnesota; [8]New York Rochester Emerging Infections Program at the University of Rochester Medical Center, Rochester, New York; [9]Vanderbilt University Medical Center, Nashville, Tennessee

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Background. Recently, overall reductions for invasive MRSA infections (isolation from a normally sterile site) have slowed. Healthcare-associated community-onset (HACO) invasive methicillin-resistant *Staphylococcus aureus* (MRSA) infections are those with recent healthcare exposures who develop MRSA infection outside acute care hospitals, and account for most invasive MRSA infections. HACO incidence decreased 6.6% per year during 2005–2008; the contribution of persons who inject drugs (PWID) to HACO incidence has not been reported.

Methods. We identified invasive MRSA infections using active, population- and laboratory-based surveillance data during 2009–2017 from 25 counties in 7 sites (CA, CT, GA, MD, MN, NY, TN). Cases were HACO if culture was obtained from an outpatient, or ≤3 days after hospitalization in a patient with ≥1 of the following healthcare exposures (HEs): hospitalization, surgery, dialysis, or residence in a long-term care facility (LTCF) in the past year; or central vascular catheter ≤2 days before culture. We calculated incidence (per census population) overall, for PWID cases and others, and for cases associated with each HE. For each HE, we calculated the proportion of overall incidence increase for PWID and others.

Results. HACO MRSA incidence declined overall from 2009 to 2016 but increased from 2016 to 2017 overall (8%), for both PWID (63%) and others (5%) (figure). For both PWID and non-PWID, incidence from 2016 to 2017 increased by 0.5 cases/100,000 population; 91% of the increase in PWID occurred in cases with a past year hospitalization while 78% of the increase in cases not associated with injection drug use (IDU) occurred in cases with past year LTCF residence. Past year LTCF residence was less common among PWID (16%) then among other cases (38%, $P < 0.01$).

Conclusion. After years of declines, HACO MRSA incidence increased equally in 2017 for cases associated with IDU and in cases unrelated to IDU. Increases in PWID-associated cases account for half the overall increase, indicating that efforts to reduce HACO MRSA should address PWID risk factors as these infections may be due to self-injection. In addition, increases not related to PWID, if sustained, would be a reversal of historic trends and require further investigation into causes.

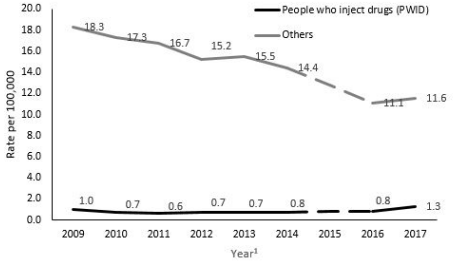

Figure. Invasive healthcare-associated community-onset methicillin-resistant *Staphylococcus aureus* rate per census population by year, for cases associated with people who inject drugs (PWID), and cases not associated with PWID, 2009–2017.

[1]Not all sites reported data in 2015.

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470. Treatment of Acute Bacterial Skin and Skin Structure Infections (ABSSSI) in Patients with Significant Drug Abuse: Outcomes from Global Phase 3 Studies of Delafloxacin (DLX)

J. Scott Overcash, MD, FACEP[1]; William O'Riordan, MD[2]; Megan Quintas, BS[3]; Laura Lawrence, BS[3]; Carol Tseng, PhD[4] and Sue Cammarata, MD[5]; [1]eStudySite, San Diego, California; [2]e Study Sites, San Diego, California; [3]Melinta Therapeutics, Inc., Morristown, New Jersey; [4]Firma Clinical, Huntsville, Maryland; [5]Melinta Therapeutics, Morristown, New Jersey

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Background. Delafloxacin (DLX), an IV/oral anionic fluoroquinolone antibiotic, is approved for the treatment of ABSSSI including those due to MRSA and Gram-negative pathogens including *P. aeruginosa*. Two global phase 3 ABSSSI trials included patients with substance abuse including IV drugs.

Methods. Two multicenter, double-blind, double-dummy trials of adults with ABSSSI randomized patients 1:1 to receive either DLX monotherapy or vancomycin 15 mg/kg + aztreonam (VANAZ) for 5–14 days. Study 302 used DLX 300 mg BID IV only; study 303 used DLX 300 mg BID IV for 3 days with a mandatory blinded switch to DLX 450 mg oral BID. Key endpoints were Objective Response at 48–72 hours with ≥20% reduction in lesion size, and Investigator assessment of outcome at Follow-up (FU, Day 14), both in the Intent To Treat population.

Results. In the 2 studies, 620 patients with substance abuse, excluding alcoholism, including heroin, cocaine and methamphetamine abuse, were randomized in the United States. 71% were male with mean age 44 years. Average erythema area at baseline was ~230 cm^2. 16% percent had cellulitis, 30% abscesses, and 53% wound. *S. aureus* (SA) was the most frequent pathogen. DLX was non-inferior to VANAZ for the Objective Response: 85.9% DLX vs. 84.4% VANAZ [Δ2.6 (95% CI −2.9, 8.1)] as well as the assessment of outcome at FU: 82.0% DLX vs. 79.3% VANAZ [Δ3.2 95% (CI −3, 9.4)]. Micro success in evaluable patients with SA was seen in 99.1% DLX vs. 100% VANAZ as well as 98.2% DLX vs. 100% VANAZ in patients with MRSA. The overall % of patients with at least one adverse event (AE) was comparable for DLX (49.0%) compared with VANAZ (56.1%). The most frequent treatment-related AEs were gastrointestinal in nature, including nausea seen in 9.7% DLX and 5.8% VANAZ patients, primarily mild to moderate in severity. There were no cases of *C.difficile* diarrhea. Discontinuations due to treatment-related AEs were lower with DLX (0.3%) compared with VANAZ (2.2%).

Conclusion. Fixed-dose monotherapyDLX was comparable to VANAZ in treatment of ABSSSI in patients with substance abuse based on the Objective Response as well as investigator-assessed outcome. DLX was also comparable to VANAZ in treating patients with SA and MRSA. DLX appears effective and well tolerated in patients with ABSSSI and significant substance abuse.

Disclosures. **All authors:** No reported disclosures.

471. Safety and Efficacy of Oral and/or Intravenous Tedizolid Phosphate (TZD) in Adolescents with Acute Bacterial Skin and Skin Structure Tissue Infections (ABSSSI)

John S. Bradley, MD[1]; Tinatin Antadze, MD[2]; Ismail H. Mitha, MD[3]; Borislav Ninov, MD, PhD[4]; Mohammed S. Tayob, MD[5]; Natasha Broyde, MS[6]; Joan R. Butterton, MD[6]; Margaret Z. Chou, MS[6]; Carisa S. De Anda, PharmD[6]; Jason Y. Kim, MD, MSCE[6] and Pamela S. Sears, PhD[6]; [1]University of California San Diego, Dept of Pediatrics, School of Medicine, San Diego, California; [2]LTD M. Iashvili Children's Central Hospital, Tbilisi, Tbilisi, Georgia; [3]Worthwhile Clinical Trials, Benoni, Gauteng, South Africa; [4]UMHAT Dr. Georgi Stranski EAD, Pleven, Pleven, Bulgaria; [5]Mzansi Ethical Research Centre, Middelburg, Mpumalanga, South Africa; [6]Merck & Co., Inc., Kenilworth, New Jersey

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Background. Tedizolid phosphate has activity against gram-positive pathogens, including methicillin-resistant *Staphylococcus aureus*, and was approved for the treatment of ABSSSI in adults in 2014. This study compared the safety and efficacy of TZD with protocol-specified, active comparators for the treatment of ABSSSI in adolescents.

Methods. This was a randomized, assessor-blind, global, multicenter, phase 3 study of TZD vs. active comparator for the treatment of gram-positive ABSSSI in adolescents (aged 12 to < 18 years; NCT02276482). Enrolled patients were stratified by region and randomized 3:1 to TZD 200 mg (IV and/or oral) once daily for 6 days or investigator-selected active comparator per local standard of care (IV vancomycin, linezolid, clindamycin, flucloxacillin, or cefazolin, and/or oral linezolid, clindamycin, flucloxacillin, or cephalexin) for 10 days. The primary endpoint was safety. The percentages of patients with treatment-emergent adverse events (TEAEs) were documented; secondary efficacy endpoints included the blinded investigator's assessment of clinical success at a test of cure visit (18–25 days after start of dosing) and early clinical response (≥20% reduction from baseline lesion area) at 48–72 h. No hypothesis testing was planned for the treatment groups.

Results. Of the 121 patients enrolled, 120 were treated (TZD, $N = 91$; comparator, $N = 29$). Median (range) age was 15 (12–17) years. Most patients were male (62.5%), white (86.7%), and enrolled in Europe (78.3%). Infections included major cutaneous abscess (42.5%), cellulitis/erysipelas (40.0%), and infected wound (17.5%). At baseline, the median (range) lesion surface area was 82.1 (14–978) cm^2. Of those with gram-positive cultures ($n = 64$), *S. aureus* was most frequently isolated ($n = 55$ [85.9%]) with 3 isolates (4.7%) being methicillin resistant. TZD was well tolerated, and TEAEs were balanced between treatment arms (TZD, 14.3%; comparator, 10.3%). A total of 3 (3.3%) patients in the TZD group and 1 (3.4%) in the comparator group experienced a single-drug-related TEAE. Clinical success rates were high and similar between treatment groups (table).

Conclusion. TZD demonstrated comparable safety and efficacy to comparator in the treatment of ABSSSI in adolescents.

Table. Efficacy Outcomes

Outcome	Analysis Set	Response	TZD	Comparator	Difference, % (95% CI)[a]
Investigator-assessed clinical response at TOC	ITT, N		91	29	
		Clinical success,[b] n (%)	88 (96.7)	27 (93.1)	3.6 (-6.3, 13.5)
		95% CI[c]	(90.7, 99.3)	(77.2, 99.2)	
	CE, N		87	27	
		Clinical success,[b] n (%)	87 (100)	26 (96.3)	3.7 (-3.4, 10.8)
		95% CI[c]	(95.8, 100)	(81.0, 99.9)	
Programmatic early clinical response at 48–72 h	ITT, N		91	29	
		Success/responder,[d] n (%)	84 (92.3)	28 (96.6)	-4.2 (-12.9, 4.4)
		95% CI[c]	(84.8, 96.9)	(82.2, 99.9)	

CE, clinically evaluable; CI, confidence interval; ITT, intent-to-treat; TOC, test of cure; TZD, tedizolid phosphate.

[a]The difference (TZD minus comparator) in the clinical success rate and 95% CI calculated using the unstratified method of Miettinen and Nurminen.

[b]Met all of following criteria: Resolution or near resolution of most disease-specific signs and symptoms; absence or near resolution of regional or systemic signs of infection (lymphadenopathy, fever, >10% immature neutrophils, abnormal white blood cell count), if present at baseline; no new signs, symptoms, or complications attributable to the infection under study (no further antibiotic therapy required for the treatment of the primary lesion).

[c]An exact 2-sided 95% CI determined for the rate of clinical success in each treatment group using the Clopper-Pearson method.

[d]Minimum ≥20% reduction from baseline lesion area.

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