of stay was reduced by 0.65 days and 1.37 in the CAZ-AVI arms of the MDRE and MDRPA analyses, respectively.

Conclusion. CAZ-AVI is a cost-effective alternative to meropenem in the treatment of HAP/VAP caused by MDRE or MDRPA in China.

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1605. Differences in Clinical Characteristics of Third Generation Cephalosporin Resistance and Treatment Outcomes in *Escherichia coli* and *Klebsiella pneumoniae* Bacteremia in Patients with Liver Cirrhosis

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Session: P-71. Treatment of Antimicrobial Resistant Infections

Background. This study aimed to identify characteristics of third-generation cephalosporin (3GC) resistance in *Escherichia coli* bateremia (ECB) and *Klebsiella pneumoniae* bacteremia (KPB) in patients with liver cirrhosis (LC), and to investigate the effects of appropriateness of empirical antibiotic treatment on outcomes.

Methods. We retrospectively collected demographic, clinical and microbiological information on all ECB and KPB episodes in LC patients ≥ 18 years of age hospitalized to a tertiary-care teaching hospital in South Korea from 2007 to 2018. Clinical characteristics associated with 3GC resistance and treatment failure were analyzed using a multivariate logistic regression model. Treatment failure was defined as persistent bacteremia for ≥ 7 days, or relapsed bacteremia ≤ 30 days, or all-cause mortality ≤ 30 days.

Results. 3GC resistance rates of *E. coli* were 30.3% overall and increased significantly during the study period (*P*=0.001), while the rates of *K. pneumoniae* were not changed (24.3% overall) (P=0.994). Of total 356 ECB and KPB episodes, 112 were caused by 3GC resistant strains. The factor associated with 3GC resistance was isolation of 3GC resistant strain ≤ 1 year in both ECB (OR, 7.754; 95% CI, 2.094~28.716) and KPB (OR, 2.774; 1.318~5.838). In ECB, beta-lactam or fluoroquinolone treatment ≤ 30 days was another factor associated with 3GC resistance (OR, 2.774; 95% CI, 1.318~5.838), but not in KPB. The factor associated with treatment failure was high MELD score in both ECB (OR, 1.193 at 1 increase; 95% CI, 1.118~1.272) and KPB (OR, 1.163; 95% CI 1.083~1.250). Additionally, in ECB, non-alcoholic LC (OR 3.262; 95% CI 1.058~10.063), high Charlson Comorbidity Index (OR, 1.285; 95% CI 1.066~1.548), and inappropriate empirical antibiotic treatment (OR, 3.194; 95% CI 1.207~8.447) were associated with treatment failure.

Conclusion. During the study period, 3GC resistance increased in ECB, but not in KPB. In ECB, the severity of the underlying disease and the appropriateness of empirical antibiotics were associated with treatment failure, but there was no correlation in KPB. In ECB of LC patients, the appropriateness of empirical antibiotics was a factor associated with treatment outcome, and is the only correctable factor in the clinical setting.

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1606. Distinct Effectiveness of Oritavancin Against Tolerance-Induced Staphylococcus aureus

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Session: P-71. Treatment of Antimicrobial Resistant Infections

Background. Within a sufficiently large bacterial population, some members will naturally adopt an alternate, metabolically-active state that favors small molecule synthesis over cell division. In *Staphylococcus aureus* this process can be sharply accelerated by multiple factors present during infection including nutrient limitation, host cationic peptide exposure and polymorphonuclear neutrophil internalization. These isogenic "tolerant" subpopulations have variable responses during antibiotic exposure and can remain viable in the presence of typically bactericidal concentrations. Survivors of antibiotic exposure can restart cell division upon cessation of antibiotics and cause relapse or recurrent infection. In this study we determine the ability of typical and atypical antistaphylococcal therapies to reduce the viability of tolerant *Staphylococcus aureus* bacteria.

Methods. *S. aureus* strain ATCC29213 as well as four clinical isolates (two MSSA, two MRSA) were selected for analysis. Overnight cultures were diluted in pre-warmed broth (MHB50) to 1×10^6 cfu/mL. Tolerance was induced by exposure to mupirocin (low [0.032 µg/mL] or high [3.2 µg/mL]) for 30 min. Tolerant cultures were exposed to vancomycin (35 µg/mL), cefazolin (25 µg/mL), daptomycin (7 µg/mL), telavancin (10 µg/mL), dalbavancin (6 µg/mL) or oritavancin (14 µg/mL) and viability was assessed by dilution plating at pre-defined time points (0, 2, 6, 24, 48 h). The minimum duration for 3-log viability reduction from baseline ($MDK_{99.9}$) and culture viability at 48h were calculated independently for each of three biological replicates.

Results. The rate of bacterial killing ($MDK_{99.9}$) was reduced for all study antibiotics by the addition of mupirocin in a dose-dependent manner. In contrast to all other regimens, including lipoglycopeptide comparators, oritavancin was the only antimicrobial agent that maintained a similar extent of bacterial killing against tolerant staphylococci.

Conclusion. Antimicrobial tolerant staphylococci exhibit a decreased rate of killing by antistaphylococcal agents. However, oritavancin remained effective at maintaining a similar extent of killing. Further studies to investigate the role of otritavancin against recurrent or relapse staphylococcal infection is warranted.

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1607. Dual Therapy with Aztreonam & Ceftazidime/Avibactam Against Multi-Drug Resistant *Stenotrophomonas maltophilia* on Tricuspid Valve Endocarditis

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Session: P-71. Treatment of Antimicrobial Resistant Infections

Background. Antimicrobial resistance in *Stenotrophomonas maltophilia* is one of the most complex among Gram-negatives. Presence of regulating non-specific antimicrobial class efflux pumps and chromosomal encoded L1 metallo-betalactamase (Ambler Class B) and L2 betalactamase (Ambler Class A) are responsible for few clinically active antimicrobials and pan-drug resistant strains.

Methods. A 38 year old male with a history of IV drug use, chronic hepatitis C, and recent MSSA endocarditis was admitted with sepsis. Workup revealed tricuspid valve endocarditis with pulmonary septic emboli due to *S. maltophilia*. Initial antibiotics were levofloxacin (LVX), metronidazole, and piperacillin-tazobactam (TZP) followed by LVX and minocycline (MIN). He had valve replacement on day 6. Repeat blood cultures and valve tissue culture revealed pan-resistant *S. maltophilia* (resistant: ceftazidime (CAZ), LVX, MIN, TMP/SMX, chloramphenicol; intermediate: MIN; eravacycline MIC 8 µg/mL; tigecycline MIC 16 µg/mL). Microbiology Department was consulted for additional antimicrobial options. *In vitro* testing for aztreonam (ATM) with ceftazidime/avibactam (CZA) was recommended.

Results. Synergy testing between ATM and CZA was performed by positioning ATM strip over the area where CZA had been previously been placed and removed after 10 minutes of incubation. The interception of the growth with the ATM strip was read. In presence of avibactam, ATM MIC was 4 µg/mL, 6 two-fold dilutions lower than ATM without CZA. MIC for ATM (256 µg/mL), CAZ (256 µg/mL) and CZA (32 µg/mL) were tested individually. ATM with CZA was recommended as a salvage treatment based on *in vitro* result. Patient completed 6 weeks of ATM with CZA along with MIN. He achieved microbiologic clearance and clinical recovery from infection. At the end of treatment, he experienced episodes of refractory ascites. With complex comorbidities, patient was not a transplant candidate and transitioned to hospice two weeks later.

Conclusion. Although the surgical excision was key, treatment with ATM and CZA provided effective antimicrobial treatment in the setting of persistent positive blood culture. ATM with CZA should be considered for cases of pan-drug resistant *S. maltophilia* with limited treatment options.

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1608. Efficacy of Ceftolozane/Tazobactam for Multidrug-Resistant Gram-Negative Infections in Multiple Urban Hospitals

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Session: P-71. Treatment of Antimicrobial Resistant Infections

Background. Ceftolozane/tazobactam (C/T) is a novel cephalosporin/beta-lactamase inhibitor combination developed for use against multidrug-resistant (MDR) Gram-negative infections, particularly *Pseudomonas aeruginosa* (PA). C/T is approved for complicated urinary tract and intraabdominal infections as well as hospital-acquired/ventilator-associated bacterial pneumonias. However, comprehensive clinical characterization of patients treated with C/T in non-FDA-approved indications is limited.