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Session: 65. Mechanisms of Antimicrobial Resistance
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Background. Local and systemic use of azole derivatives are common in the treatment of vulvovaginal candidiasis. However, there are cases unresponsive to these agents. Herein, we report present treatment and follow-up of a patient with fluconazole–itraconazole and voriconazole-resistant recurrent vaginal candidiasis.

Methods. A 37-year-old woman with no comorbidity used topical and oral antifungal/antibacterial medications (including fluconazole and itraconazole) in the treatment of recurrent vulvovaginitis, was hospitalized due to continuous complaints. Intense, white-colored, odorless vaginal discharge was observed on physical examination. Urine and vaginal swab samples were taken for microbiological and bacteriological culture. Metronidazole (500 mg 3×1 i.v.) and high dose fluconazole (600 mg/day i.v.) were initiated empirically for the possibility of dose-dependent resistant Candida infection, but there was no clinical response.

Results. Candida albicans was isolated in vaginal swab culture, but response to systemic fluconazole treatment for one week was inadequate. Antifungal susceptibility testing was performed by microdilution method according to CLSI M27A3 guidelines and MIC values of resistant were: fluconazole 4 μg/mL (S), posaconazole 0.06 μg/mL (WT), voriconazole 0.25 μg/mL (SDD), anidulafungin ≤ 0.015 μg/mL (S), amphotericin B 0.06 μg/mL (WT). For the resistance mechanism, point mutation in the ERG11 gene and MDR1 and MDR2 from efflux pumps were investigated and only the G464S mutation was detected in the ERG11 gene. Treatment was switched to IV anidulafungin (200 mg on day 1 followed by 100 mg/day). Clinical response was achieved in the patient whose complaints were reduced, and there was no Candida in the repeated vaginal swab culture taken on day 3 of treatment. The patient was discharged after 2 weeks of treatment. She had no recurrence after 2 years follow-up.

Conclusion. It should be kept in mind that resistant strains may be responsible for recurrent and unresponsive vulvovaginal candidiasis cases. Although there is no case report in which anidulafungin is used for treatment and it should be kept in mind that the anidulafungin is also in the treatment as it is summarized.

Disclosures. All authors: No reported disclosures.

619. High Multidrug-Resistant due to TEM and CTX-M-1 Types of Extended-Spectrum β-Lactamase and blaNDM-1 Type Carbapenemase Genes among Clinical Isolates of Gram-Negative Bacilli in Asella, Central Ethiopia
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Methods. In total, 684 patients 21 year of age with fever admitted to the Asella Teaching Hospital from April 2016 to June 2018 were included. Blood and other appropriate clinical specimens were cultured. Susceptibility testing was performed using the Kirby–Bauer method and VITEK2. Confirmation of species identification and identification of resistance were conducted using MALDI-ToF and PCR at a microbiology laboratory in Düsseldorf, Germany.

Results. In total, 684 study participants were included; 54% were male and mean age was 26.7 years. Thus, the overall culture positivity rate was 7.5%. Of the 83 cultured organisms, 38(46%) were Gram-negative, 41(52%) Gram-positive, and 2(2%) Candida species. Among the 38 Gram-negative isolates, 16(42%) were E. coli, 15(39%) K. pneumoniae, and 4(11%) P. aeruginosa. Resistance against commonly used antibiotics for Gram-negative at the study site was: piperacillin/tazobactam 48%(13), ampicillin/sulbactam 93%(25), cefotaxime 89%(24), ceftazidime 74%(20), Cefepime 74%(20), meropenem 77%(2), imipenem 4%(1) and gentamicin 36%(15). Of 27 Gram-negative isolates available for resistance-gene detection, blaNDM-1 was detected in one K. pneumoniae isolate and blaNDM-1 plus blaOXA-51 in A. baumannii. 81%(22/27) of the Gram-negative rods were confirmed to contain ESBL genes as follows: TEM 17(77%), CTX-M-1 group 15(51%), SHV-6(27%), and CTX-M-9 group 20(9%). Among isolated S. aureus, 1(5%) was confirmed to be Mecillinic-resistant S. aureus.

Conclusion. We found a high prevalence (81%) of ESBL-producing bacteria and 7.4% carbapenem resistance at the study site. More than half of Gram-negative isolates had two or more mobile resistance genes. These findings warrant the need for local national multidrug-resistant surveillance. Strengthening of antimicrobial stewardship programs is needed in order to face the threat of multidrug-resistant bacteria.

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620. Sub-MIC Concentrations of Levofloxacin and Delafloxacin Enhance Staphylococcus aureus Biofilm Formation: Significance of Maximizing Exposure Emily C. Bodo, PharmD; Kathryn E. Daffinee, BS; Kerry LaPlante, PharmD; Rhode Island Infectious Diseases Research Program, Worcester, Massachusetts

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Background. Fluoroquinolones are utilized in Staphylococcal prosthetic joint infection. Since their anti-biofilm effects are compromised when antibiotic dosing is not optimized or antibiotics do not reach the site of infection, additional virulence factors may upregulate. We aimed to determine whether exposure to sub-MIC concentrations of levofloxacin and delafloxacin affect biofilm formation in Staphylococcus aureus.

Methods. This study utilized 50 diverse methicillin-susceptible S. aureus (MSSA) clinical isolates collected between 2004 and 2018. Sources included blood, skin/tissue, bone, and joint fluid. Minimum inhibitory concentrations and minimum bactericidal concentrations were identified according to CLSI. Biofilm assays were conducted as previously described by our program. Biofilm quantification was categorized as strong (OD570 ≥ 2), moderate (OD570 ≥ 1 and < 2), or weak (OD570 < 1). Prevention assays were conducted with the addition of increasing concentrations of delafloxacin or levofloxacin. We evaluated the amount of isolates that demonstrated increased biofilm formation in the presence of sub-MIC concentrations and extent of biofilm enhancement. Percent change was calculated between OD570 of the isolate growth control without antibiotic exposure and peak biofilm OD570 when exposed to the antibiotic.

Results. Of the 50 MSSA isolates, 14 (28%) exhibited moderate/strong formation and 36 (72%) exhibited weak biofilm formation. 52% and 58% of the isolates demonstrated a ≥ 250% increase in formation when exposed to sub-MIC concentrations of levofloxacin and delafloxacin, respectively. None of the strong biofilm formers demonstrated a ≥ 250% peak increase in formation when exposed to the antibiotics. Of the isolates that demonstrated a ≥ 250% increase, the average percent change was 267% (±29) with levofloxacin and 258% (±33) with delafloxacin.

Conclusion. Sub-MIC concentrations of delafloxacin and levofloxacin increased biofilm formation in S. aureus isolates that normally exhibit weak or moderate biofilm formation when not in the presence of antibiotics. Maintaining appropriate fluoroquinolone concentrations at the site of action is critical in preventing enhancement of biofilm formation. Further research is needed to identify the mechanism behind this increase.

Disclosures. All authors: No reported disclosures.

621. In vitro Cefazidime: Avibactam Resistance in Carbapenem-Resistant Enterobacteriaceae Isolates Maymonah Belal, MD; Lori Villasis, MS, SM; Elizabeth Diago-Navarro, PhD, MPH; Michael Motley, BS; Allen Young, Eric Spitzer, MD, PhD; Bettina C. Fries, MD, FIDSA; Melinda Monteforte, BS, PharmD, BCPS AQ; Stony Brook University Hospital, East Setauket, New York

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Background. Cefazidime–avibactam (CAZ-AVI) is a new antibiotic with activity against many Carbapenem-resistant Enterobacteriaceae (CRE). Although CAZ-AVI is a well tolerated agent, the lack of local data concerning causative pathogens and resistance patterns results in suboptimal empirical treatment and unfavorable clinical outcome. The objective of this study was the characterization of bacterial pathogens in hospitalized patients with febrile infections in Central Ethiopia.

Methods. In vitro

Results. Of the 116 CRE isolates from CAZ-AVI resistance by Kirby–Bauer (KB) disk diffusion susceptible. Resistance isolates were verified by repeat KB and E-test performed by the Stony Brook Hospital laboratory. The blaKPC gene of resistant strains was amplified by PCR and sequenced. Patient data were used to determine whether patients were colonized or infected, and whether they were exposed to CAZ-AVI.

Conclusion. Of the 116 CRE isolates from 86 patients (96%) counts, 50% were Klebsiella species, 23.2% were Enterobacter species, 10.3% E. coli and 16.5% CRE. CRE were recovered from colonized (37%) and infected (63%) patients of which 18% were treated with CAZ-AVI during their hospitalizations (median duration of therapy, 6 days). Two CRE isolates (1.7%) were found to be resistant on repeated testing. One isolate was K. pneumoniae derived from the sputum of a patient diagnosed with ventilator-associated pneumonia who received 40 days of CAZ-AVI therapy prior to isolation of the resistant isolate (KB diameter 20 mm, MIC > 5 μg/mL by E-Test). Sequencing of the strain blaKPC gene revealed a previously described Ambler-type B beta-lactamase D179Y mutation that has been shown to convey resistance. The second CAZ-AVI-resistant K. pneumoniae (KB diameter 19 mm, MIC 64 μg/mL by E-Test) was isolated from the urine of a colonized patient naïve to CAZ-AVI therapy. The strain's blaKPC gene was sequenced.

Conclusion. In our strain collection, the rate of resistance to CAZ-AVI remains low.<2%. Although we found one mutation (D179Y) previously linked to CAZ-AVI resistance we also discovered one K. pneumoniae isolate with in vitro resistance to CAZ-AVI that did not exhibit any blaKPC mutations conveying CAZ-AVI resistance. Interestingly, this strain