**482. Time Series Analysis of Antimicrobial Consumption and *Pseudomonas aeruginosa* Resistance in an Academic Medical Center in the United States (2013–2018)**

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**Session:** 53. HAI: MDRO – GNR Epidemiology, Other
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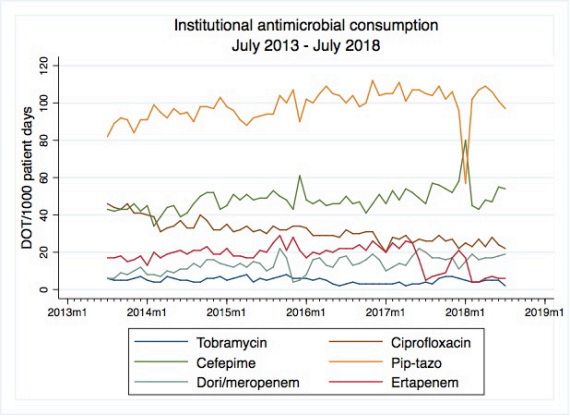
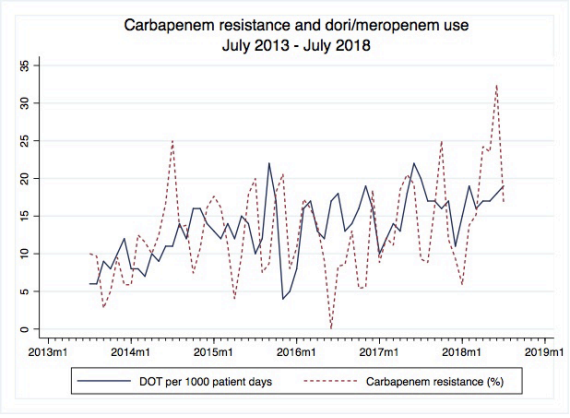
***Background.*** Monitoring antimicrobial use and resistance are key components of initiatives to promote antimicrobial stewardship and prevent antimicrobial-resistant infections. In this surveillance study, we evaluated trends in resistance among healthcare-associated *P. aeruginosa* isolates and potential associations with antimicrobial consumption.

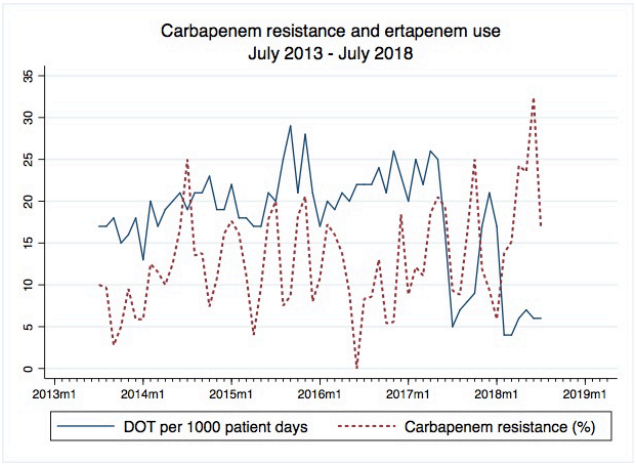
***Methods.*** We established a retrospective cohort of *P. aeruginosa* isolates collected ≥48 hours after inpatient admission at a 1,300-bed academic medical center from July 1, 2013 to July 31, 2018. We included isolates from all clinical cultures and retained the first isolate for a patient encounter. We defined the multidrug-resistant (MDR) status in accordance with the phenotype definitions established by the Centers for Disease Control and Prevention. We calculated the monthly percentage of class-specific resistance and MDR status among isolates. We measured monthly antimicrobial consumption as days of therapy per 1,000 patient-days. To evaluate potential associations between identified trends in resistance and antimicrobial use, we constructed autoregressive integrated moving average models (ARIMA) with transfer functions.

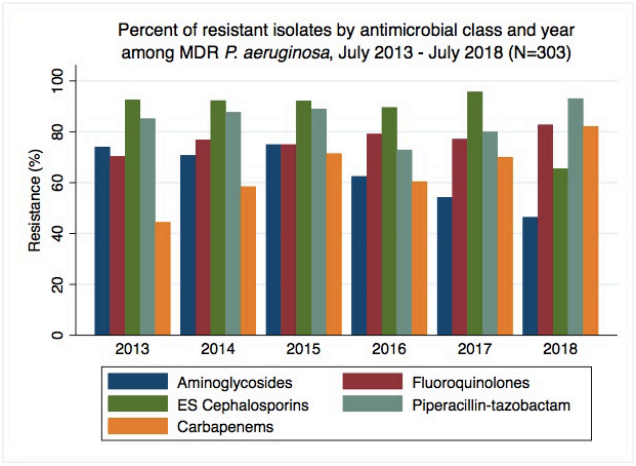
***Results.*** Of 1,897 isolates included in the analysis, 303 (16.0%) were classified as MDR *P. aeruginosa*. The rate of healthcare-associated *P. aeruginosa* infections and percent of MDR isolates remained stable over the five-year study period. However, we identified trends in resistance to specific antimicrobial classes: there was a significant increase in resistance to antipseudomonal carbapenems, while resistance to aminoglycosides and extended-spectrum cephalosporins decreased. Using the ARIMA modeling strategy, bivariable analyses of resistance and antimicrobial use revealed that carbapenem-resistant *P. aeruginosa* was positively correlated with the use of antipseudomonal carbapenems at a 1-month lag and ertapenem at a 5-month lag.

***Conclusion.*** Risk assessments that only measure rates of MDR organisms may miss underlying trends in class resistance. Increasing carbapenem resistance despite a stable proportion of MDR isolates highlights a critical area for continued monitoring and antimicrobial stewardship initiatives targeted at carbapenem use in our hospital.




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

**483. Case–control Study Evaluating the Risk of *Stenotrophomonas maltophilia* Pneumonia in Patients with Previous Exposure to Meropenem**

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***Background.*** *Stenotrophomonas maltophilia* (SM) is a growing cause of opportunistic nosocomial infections with a mortality rate of 23–77%. Previous studies have identified the use of broad-spectrum antibiotics, specifically carbapenems, as a risk factor for SM infection, but these findings were limited to secondary endpoints. Meropenem's overall broad-spectrum activity but limited SM activity may favor SM colonization and infection.

***Methods.*** Adult patients admitted between January 2016 and July 2018 with available culture data were identified using data mining software. Cases were defined by a positive SM respiratory culture between days 2 and 60 of admission and receipt of antibiotic treatment. Controls were defined by a respiratory culture negative for SM during the same period. The primary endpoint was to evaluate the exposure to at least 48 hours of meropenem between cases and controls, with exposure defined as at least 48 hours of meropenem treatment with the last dose given within 15 days of respiratory culture. Secondary endpoints were to evaluate exposure to at least 7 days of meropenem or other antipseudomonal antibiotics.

***Results.*** A total of 225 patients were included, 106 as cases and 119 as controls. Baseline demographics and age-adjusted Charlson comorbidity index score were similar between groups. Twenty-one cases (19.8%) and 5 controls (4.2%) were exposed to at least 48 hours of meropenem before developing SM pneumonia. The odds of meropenem exposure was 5 times greater in cases than controls (OR = 5.6, $P < 0.001$). After adjusting for a longer length of stay before culture collection as a potential confounding variable, meropenem use was still associated with SM pneumonia (adjusted OR = 4.6, 95% CI 1.7–14.7). Significant associations were also found with exposure to at least 7 days of meropenem (OR = 4.7, 95% CI 1.52–14.77, P = 0.004) or other antipseudomonal antibiotics (OR = 3.0, 95% CI 1.59–5.71, $P < 0.001$).

***Conclusion.*** This is the first study to evaluate meropenem as a risk factor for developing SM pneumonia. Even as little as 48 hours of meropenem exposure increases the risk of developing SM pneumonia. As one of the few modifiable risk factors for SM infection, judicious use of meropenem may reduce the incidence of SM infection and associated mortality.