Path to Resistance: Risk Factors Associated With Carbapenem-Resistant Pseudomonas aeruginosa

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Recommended Citation
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≥ 18 years old who presented to an Aurora Health Care facility
Methods:
with carbapenem-resistant

Purpose:
To determine if traditional and/or new risk factors for
P. aeruginosa resistance are valid and predictive of infection
with carbapenem-resistant P. aeruginosa.

Methods: We retrospectively studied inpatients and outpatients
≥ 18 years old who presented to an Aurora Health Care facility
with a positive P. aeruginosa culture during 2014. Cultures
were obtained from the ACL Laboratories database, and patient
medical records were reviewed in Epic. Chi-squared test with
Yates correction and two-sample t-tests were performed on
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regression was used for multivariable modeling. Significance
was associated with P<0.05.

Results: Study population (N=1,763) characteristics were:
mean age 68.0, body mass index 30.4 kg/m², 51.2% female
sex, and 89.3% white race. Resistance to imipenem or
meropenem (14.0%) on univariable analysis was associated
with younger age (66.0 vs 68.3 years, P=0.027), hospitalized
patients (19.7% vs 8.6%, P<0.0001), male sex (16.0% vs
12.0%, P=0.017), nonwhite race (23.5% vs 12.3%, P<0.0001),
respiratory culture (30.9% vs 12.1%, P<0.0001), history of
pulmonary disease (33.3% vs 33.6%, P=0.003) and recent
surgery (17.8% vs 12.2%, P=0.002), as well as transfer from
institution, Foley catheter, vasopressor treatment, central/PIC
lines, mechanical ventilation, ICU admission, and bedridden
status (all P<0.0001). In multivariable modeling, nonwhite
race, respiratory culture, recent transfer, vasopressor use and
central/PIC lines were significant. Only 0.57% of strains were
resistant to the six traditional non-carbapenem drugs and both
carbapenems.

Conclusion: Demographic and traditional risk factors, as well as
respiratory cultures, were predictive of carbapenem resistance.
Such information may guide initial antibiotic treatment of P.
aeruginosa. Fortunately, less than 1% of strains were resistant
to all drugs tested. Further studies looking at change in outcome
while incorporating these risk factors in determination of
empiric coverage for patients should be performed.

FIRST PLACE ORAL PRESENTATION
See page 245 for citation.

SECOND PLACE ORAL PRESENTATION
Path to Resistance: Risk Factors Associated With
Carbapenem-Resistant Pseudomonas aeruginosa

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Center; Department of Family Medicine, Aurora UW
Medical Group; Center for Urban Population Health

Background: An estimated 51,000 health care-associated
Pseudomonas aeruginosa infections occur in the United States
annually. More than 13% are secondary to non-carbapenem
multidrug-resistant strains, which result in 400 yearly deaths.
Traditional risk factors for resistance include ICU stay,
mechanical ventilation, previous hospitalization and major
comorbidities. As microbes evolve, risk factors also may
evolve.

Purpose: To determine if traditional and/or new risk factors for
P. aeruginosa resistance are valid and predictive of infection
with carbapenem-resistant P. aeruginosa.

Methods: We retrospectively studied inpatients and outpatients
≥ 18 years old who presented to an Aurora Health Care facility
with a positive P. aeruginosa culture during 2014. Cultures
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