



Antimicrobial Stewardship Program (ASP) Efforts to Reduce Antimicrobial Usage in Geriatric Patients Without Affecting Outcomes

James Mauro, PharmD¹; Saman Kannangara, MD²; Roman Tuma, MD²; David Livert, PhD^{3,4}

¹Department of Pharmacy, Easton Hospital, Easton, PA; ²Department of Internal Medicine, Division of Infectious Diseases, Easton Hospital, Easton PA; ³Department of Internal Medicine, Easton Hospital, Easton, PA; ⁴Penn State University, Lehigh Valley, PA

ABSTRACT

Background: There is limited literature evaluating ASP outcomes in patients 65 years and older. The primary objective of this study was to show that ASP efforts to deescalate and/or discontinue antimicrobial therapy in this age group did not lead to an increased rate of 30-day hospital readmissions due to treatment failure. The secondary objective was to show a decrease in antimicrobial expenditure per adjusted patient day (APD).

Methods: A retrospective chart review was performed to compare the rates of 30-day readmissions of patients 65 years and older who received ASP interventions between January and June 2017 with a control sample who received antibiotics between January and June 2015 (pre-ASP). Patients were included if they received antibiotics for pneumonia (PNA), urinary tract infection (UTI), acute bacterial skin and skin structure infection (ABSSSI) and complicated intra-abdominal infection (cIAI). The ASP team met daily to review patients identified by the clinical pharmacist. ASP interventions consisted of de-escalation of empiric or definitive therapy, change in duration of therapy or discontinuation of therapy. Treatment failure was defined as readmission due to re-infection or a new infection (e.g. *Clostridium difficile*).

Results: Overall, 461 patients (150 control; 311 intervention) were included. The 30-day readmission rate for all infections decreased during the intervention period (10.7% vs 3.9%, p=0.004). There was a statistically significant decrease in 30-day readmissions in the PNA arm (9.8% vs. 2.9%, p=0.038), a marginally significant decrease in the UTI arm (12.5% vs. 4.7%, p=0.097), and no statistically significant change in the ABSSSI (5.6% vs. 8.6%, p=0.694) and cIAI (20.8% vs 6.7%, p=0.233) arms. Total APD was 16,267 (control) and 15,487 (intervention). Total antimicrobial expenditure during the control period was \$379,643 (\$23.33/APD) vs. \$67,721 (\$4.37/APD) during the intervention period.

Conclusion: ASP efforts did not lead to an increase rate of 30-day readmissions due to treatment failure. Furthermore, there was a statistically significant decrease in readmission rates in the intervention group as well as a large decrease in antimicrobial expenditure per APD.

BACKGROUND

- Limited literature exists evaluating ASP outcomes in adult patients ≥ 65 years old¹
- Antimicrobial overuse in geriatric patients puts them at risk for:
 - Clostridium difficile* infection (CDI)
 - Increased adverse drug events
 - Colonization and/or infection with multi drug-resistant organisms (MDROs)²⁻³
- CDI in geriatric patients can be more severe and difficult to treat, leading to increased hospitalizations and deaths³

OBJECTIVES

Primary Objective

- Demonstrate that ASP efforts to deescalate and/or discontinue antimicrobial therapy do not lead to an increased 30-day hospital readmission rate due to treatment failure

Secondary Objectives

- Determine if patient-specific diagnosis (i.e., pneumonia) changes the effectiveness of ASP in preventing hospital readmissions
- Evaluate antimicrobial expenditure per adjusted patient day (APD)

METHODS

Study Design:

- Single center, retrospective chart review
- ASP team consists of a clinical pharmacist and infectious diseases physician who meet daily to review patients identified by the clinical pharmacist
- Intervention Group: adult patients ≥ 65 years old who received ASP interventions between January and June 2017
- Control Group: adult patients ≥ 65 years old who received antimicrobial therapy between January and June 2015 (pre-ASP)
- ASP interventions:
 - De-escalation or escalation of empiric or definitive therapy
 - Change in duration of therapy
 - Discontinuation of therapy

Primary Outcome:

- 30-day hospital readmission rates that can be attributed to an antimicrobial treatment failure, including: re-infection or a new infection (i.e. CDI)

Inclusion Criteria:

- Adult patients ≥ 65 years old who received antibiotics during inpatient hospital admission
- Diagnosis of PNA, UTI, ABSSSI, or cIAI

Exclusion Criteria:

- Patients who expired or transitioned to hospice care
- Intervention group: ASP recommendations not accepted

Statistical Analysis:

- T-test
- Chi-square; compare rate of 30-day readmissions between intervention and control periods with corresponding p-values
- Two-tailed p-values less than 0.05 considered statistically significant

RESULTS

Table 1. Baseline patient characteristics

Demographics	Control (n=150)	Intervention (n=311)	P-value
Age, mean (±SD)	80.60 (8.29)	80.26 (8.58)	
Male gender, n (%)	66 (44.0%)	145 (46.6%)	
Infection type, n (%)			
• PNA	61 (40.7%)	139 (43.4%)	0.414
• UTI	40 (26.7%)	106 (34.1%)	0.109
• ABSSSI	18 (12.0%)	35 (11.3%)	0.814
• cIAI	24 (16.0%)	15 (4.8%)	<0.001

Figure 2. 30-day readmission by infection type

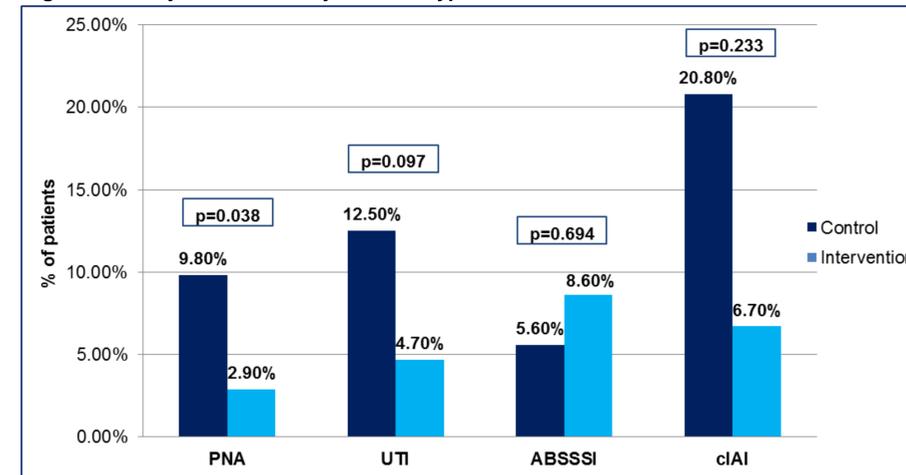


Figure 4. Antimicrobial expenditure

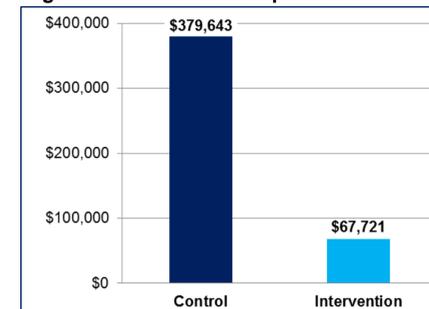


Figure 5. Antimicrobial expenditure per APD

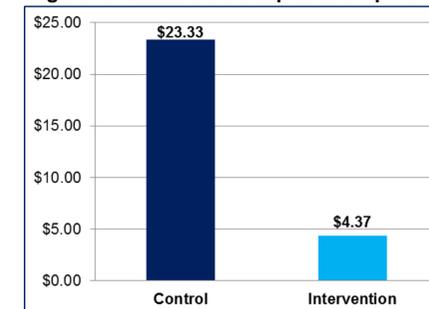


Figure 1. 30-day readmission

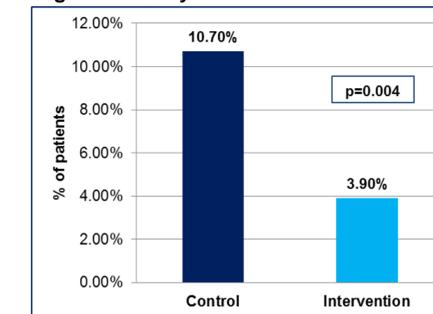


Figure 3. 30-day readmission for CDI

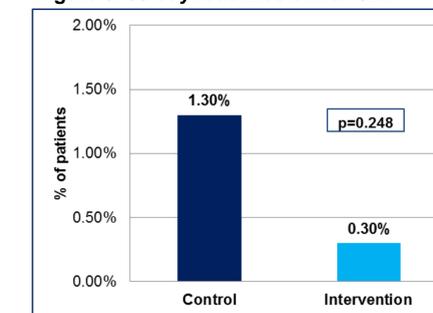
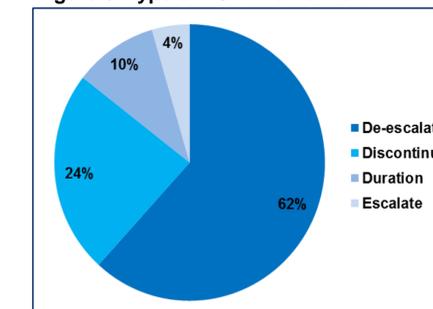


Figure 6. Type of ASP intervention



CONCLUSIONS

- ASP efforts led to decreased 30-day readmission rates for all infection types in the intervention group (p < 0.05), decreased readmission rates in the PNA subgroup (p < 0.05), and marginally significant decrease in the UTI subgroup
- No statistically significant decrease in incidence of CDI in intervention group
- ASP efforts demonstrated a large decrease in antimicrobial expenditure per APD

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DISCLOSURES

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

ACKNOWLEDGMENTS

Laura Mauro, BS, PharmD, BCPS

CONTACT INFORMATION

James Mauro, PharmD
 Easton Hospital
 250 S. 21st Street
 Easton, PA 18042
 james.mauro@steward.org

