IMPACT OF ANTIMICROBIAL STEWARDSHIP PROSPECTIVE AUDIT AND FEEDBACK ON ANTIBIOTIC UTILIZATION IN HOSPITALIZED COVID-19 PATIENTS

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Background

- Studies have shown a high proportion of antimicrobial usage in hospitalized COVID-19 patients despite low prevalence of bacterial co-infection.
- Inappropriate use of antibiotics is associated with increased risk of antimicrobial resistance, increased healthcare cost, and increased risk of adverse drug reactions.
- Improving antibiotic utilization is one of the main goals of antimicrobial stewardship program (ASP).
- At VA Southern Nevada Healthcare System (VASNHS), ASP pharmacists perform daily prospective audit with interventions and feedback. A scope of practice authorizes ASP pharmacists to independently provide ASP interventions including initiation, modification, or discontinuation of antibiotic orders.

Methods

- **Project Design:**
  - Single-center, retrospective chart review
  - Study period: November 1, 2020 to January 31, 2021
- **Project Population:**
  - Patients who were admitted to hospital for the treatment of laboratory confirmed COVID-19 infection
  - Exclusion criteria: incidental positive COVID-19 test results
- **Data Collected:** clinical presentations, procalcitonin (PCT), requirement of supplemental oxygen, vital signs, imaging findings, antibiotic therapy in the Emergency Department (ED) and upon admission, ASP interventions to antibiotic therapy, clinical outcomes, culture results, mortality, and readmission rate.
- **Statistical Analysis:** Chi-squared test or Fisher's exact test was used to analyze categorical variables. Student's t-test was used to analyze interval or ratio variables.
- **Primary Outcome:** to determine the impact of prospective audit with interventions and feedback on antimicrobial prescribing in hospitalized COVID-19 patients
- **Secondary Outcome:** prevalence of bacterial co-infection in hospitalized COVID-19 patients upon admission, prevalence of secondary bacterial infection in hospitalized COVID-19 patients, and clinical outcomes
- **Definitions**
  - **Intervention group:** ID/ASP following and/or interventions, including initiation, modification, or discontinuation of antibiotics upon admission
  - **Non-intervention group:** no antibiotics started upon admission

Results

Table 1: Baseline Characteristics

	Intervention Group (n=58)	Non-intervention Group (n=138)	P - value
Age, years, mean ± SD	66.1 ± 12.1	66.9 ± 12.9	0.68
SIRS, n(%)	28 (48.3)	56 (40.6)	0.32
qSOFA, n(%)	3 (5.2)	8 (5.8)	0.58
PCT, n(%)	53 (91.4)	107 (77.5)	0.02
PCT >0.25, n(%)	25 (47.2)	31 (29)	0.02
O2 supplement, n(%)	49 (84.5)	100 (72.5)	0.07
Imaging, n(%)	58 (100)	135 (97.8)	0.56
Remarkable imaging findings, n(%)	48 (82.8)	79 (58.5)	0.001

Figure 1: ID/ASP Interventions

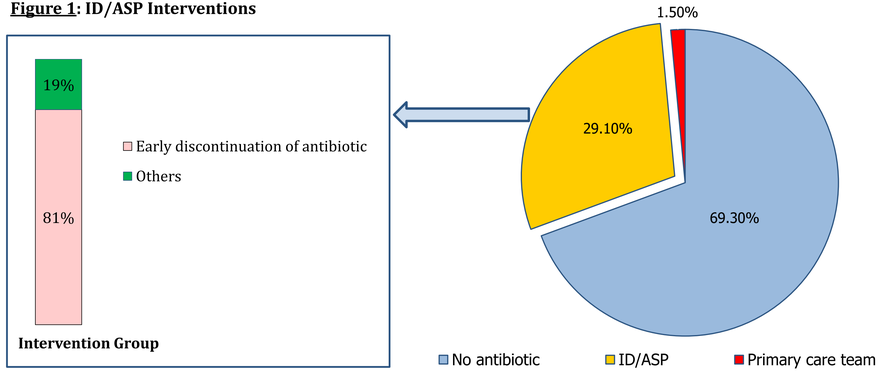


Table 2: Clinical Outcomes

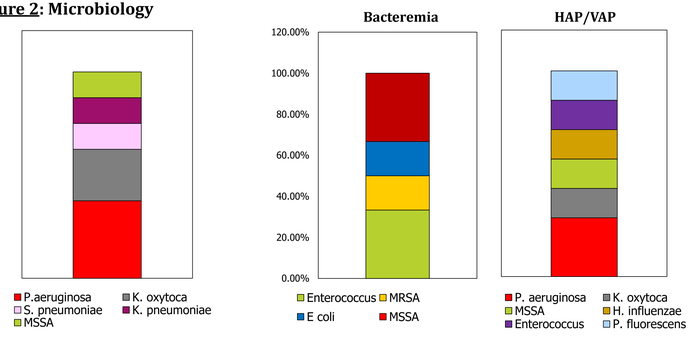
	Intervention Group (n=58)	Non-intervention Group (n=138)	P - value
Readmission, n(%)	3 (6.4)	7 (5.6)	0.29
Mortality, n(%)	11 (19)	14 (10.1)	0.09
Length of stay, days, mean ± SD	13.5 ± 12.9	10.1 ± 9.5	0.04

Results

Table 3: Bacterial Infection

	n = 199
Bacterial co-infection, n(%)	6 (3)
Nosocomial infection, n(%)	16 (8)
LOS prior to the first positive culture result, days, mean ± SD	13.3 ± 7.3

Figure 2: Microbiology



Conclusions

- Findings suggested that ASP prospective audit with interventions and feedback safely and effectively avoided the unnecessary use of antibiotic in hospitalized patients with acute COVID-19 infection.
- Findings confirmed low prevalence (2.5%) of microbiologically confirmed bacterial co-infection in patients with acute COVID-19 infection.

References

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2. Langford B, So M, Raybardhan S, et al. Bacterial co-infection and secondary infection in patients with COVID-19: a living rapid review and meta-analysis. Clin Microbiol Infect. 2020 Dec;26(12):1622-9