

Retrospective Analysis of Antimicrobial Use and Bacterial Cultures in Hospitalized Cancer Patients with COVID-19

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Background

In the era of COVID-19 concern for bacterial coinfections has resulted in widespread antimicrobial use. Sparse data are available on rates of bacterial coinfections and antimicrobial use in hospitalized immunocompromised patients with COVID-19 infection.

A review conducted by Rawson et al¹ to explore bacterial and fungal coinfections in patients admitted to the hospital with coronavirus lower respiratory tract infections, reported that 82 (8%) of 806 cases had bacterial or fungal coinfections. In the studies reviewed, a total of 1,450 (72%) of 2,010 patients received antibacterial therapy. In a meta-analysis conducted by Lansbury et al² evaluating co-infections in patients with COVID-19, 7% of hospitalized COVID-19 patients had bacterial co-infections. A higher proportion of ICU patients had bacterial co-infections than those in a mixed ward/ICU setting. The current available literature suggests that bacterial coinfections in patients with COVID-19 are relatively low, versus the high use of antimicrobials in these patients. However, there is still limited available investigating bacterial coinfections in the oncology population.

Due to the limited literature in the oncology population, the purpose of this retrospective study is to investigate antimicrobial use and positive bacterial cultures in admitted patients with COVID-19 at a tertiary cancer center.

Objectives

Primary Objective

- Evaluate the proportion of patients who received antibiotics and the proportion with positive bacterial cultures in patients with a positive COVID-19 polymerase chain reaction (PCR) result

Secondary Objectives

- 30-day mortality after a positive COVID-19 PCR result
- Number of antibiotic days and length of therapy (LOT) after a positive COVID-19 PCR result
- Length of stay (LOS) after a positive COVID-19 PCR result

Patients and Methods

- Inclusion criteria:**
 - All inpatients admitted to Memorial Sloan Kettering Cancer Center (MSKCC) with a positive COVID-19 PCR result between March 1, 2020 – June 15, 2020
 - Adults at least 18 years of age
- Electronic medical records were used to collect information including antibiotic use, bacterial coinfections, 30-day mortality, hospital LOS, ICU LOS, oxygen supplementation, and need for invasive and non-invasive oxygen support
- Descriptive statistics were utilized for data analysis
- Institutional Review Board reviewed and approved this study

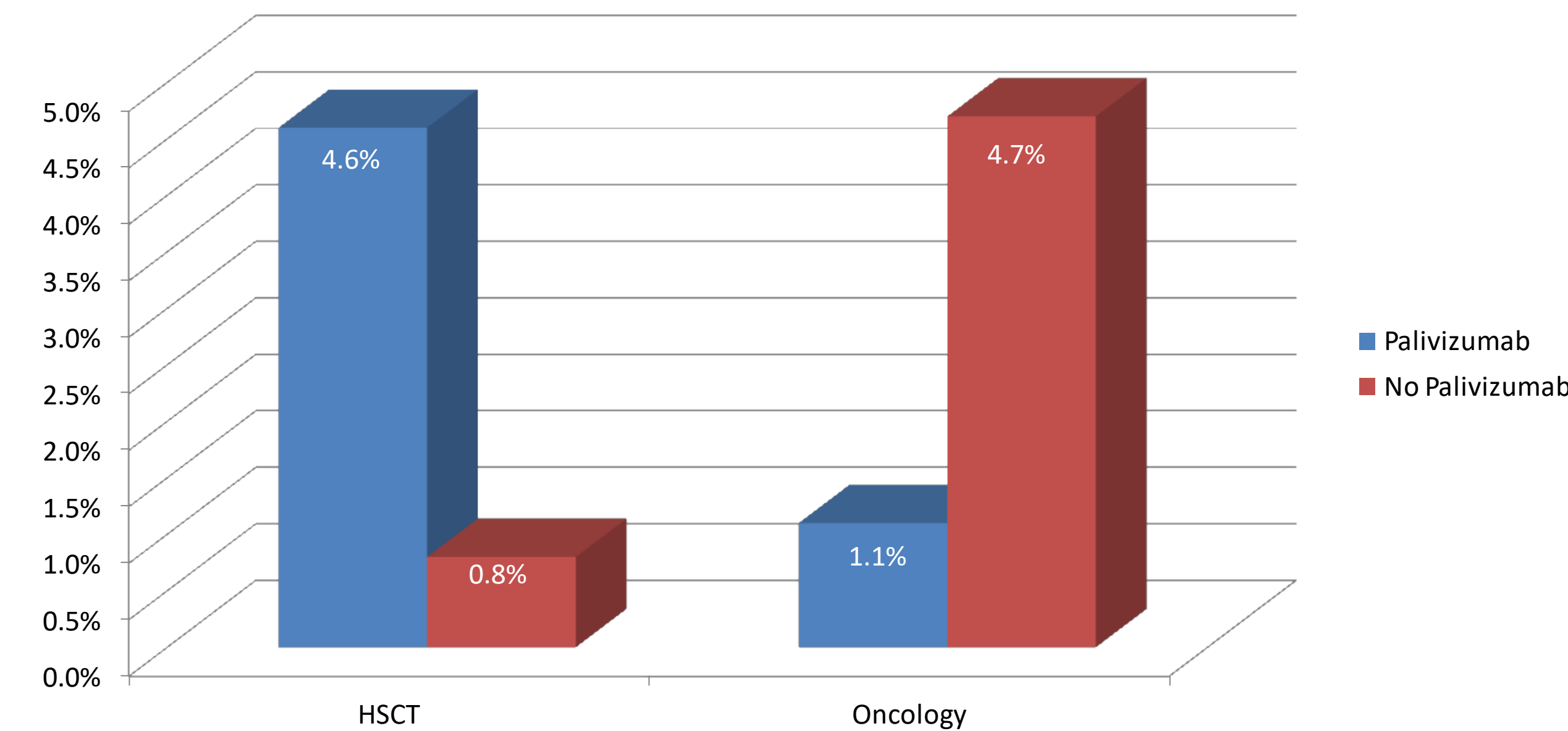
Results

- 375 patients were identified in the analysis , 358 were oncology patients
- 275 of 358 (77%) received antibiotics
- 76 of 358 (21%) patients had a positive bacterial culture result
- Overall 30-day mortality occurred in 58/358 (16%) patients
- Median LOS was 9.5 days (IQR 6, 18.8)
- Median antibiotic LOT was 4 days (IQR 1, 8)

Table 1: Patient demographics (N=350?)

Characteristics	Mean (SD)	Range
Male	103 (58)	528 (53)
Age (years)	7.4 (0.1-32)	6 (0.1-53)
Diagnosis		
ALL	60 (34)	108 (11)
AML	34 (20)	54 (5)
Lymphoma	8 (5)	89 (9)
Immunodeficiencies	64 (36)	99 (10)
Neuroblastoma	2 (1)	236 (24)
Sarcoma	0	202 (20)
CNS tumors	2 (1)	118 (12)
Other solid tumors	4 (2)	72 (8)
Other hematologic malignancies	3 (1)	12 (1)

Figure 1: 30-day Mortality



Results

Table 2: Primary Outcomes

Clinical Parameters	N(%)
Transplant	324
Palivizumab	154 (48)
No Palivizumab	170 (52)
Oncology	843
Palivizumab	23 (3)
No Palivizumab	820 (97)

Table 3: Secondary Outcomes

Clinical Parameters	N (%)
Number of RSV Positive Swabs (%)	282 (5.6%)
Transplant	
Palivizumab	94 (4.6)
No Palivizumab	16 (0.8)
Oncology	
Palivizumab	34 (1.1)
No Palivizumab	138 (4.7)
Hospitalization	16 (5.7)
PICU Admission	4 (1)

Conclusions and Future Directions

Conclusions

- The majority of hospitalized cancer patients with COVID-19 received antimicrobials whereas a much smaller percentage had a positive bacterial culture, suggesting an opportunity to streamline or discontinue antibiotics in these patients. Identifying patients at high risk for bacterial coinfection are of high priority due to the risks of adverse effects and collateral damage associated with unnecessary antimicrobial use.

Future Directions

- Design and evaluate targeted stewardship efforts to streamline or discontinue antibiotic therapy in cancer patients admitted to the hospital with COVID-19 or other respiratory viral infections.

References

- Rawson TM, Moore LP, Zhu N, et al. Bacterial and Fungal Coinfection in Individuals With Coronavirus: A Rapid Review To Support COVID-19 Antimicrobial Prescribing. *Clinical Infectious Diseases*. 2020:1-10.
- Lansbury L, Lim B, Baskaran V, et al. Co-infections in people with COVID-19: a systematic review and meta-analysis. *Journal of Infection*. 2020;81:266-275.

Disclosure

All authors 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.