Clinical Features and Outcomes of COVID-19 Infection Among Cancer Patients in Seattle, Washington

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Background

- High morbidity and mortality have been observed with SARS-CoV-2 infection. However, there are limited data on clinical characteristics of COVID-19 disease among cancer patients
- Factors such as exposures, coinfections, and antimicrobial use among cancer patients with COVID-19 disease are not well understood

Objectives

To characterize clinical features and outcomes of COVID-19 disease in cancer patients at the Seattle Cancer Care Alliance (SCCA).

Methods

- **Study design**: Retrospective chart review
- **Subjects**: 71 consecutive patients at the Seattle Cancer Care Alliance diagnosed with SARS-CoV-2 infection by RT-PCR between February 28, 2020 and June 15, 2020.
- **Models**: Generalized estimating equations with binomial distribution and logit link were used to test for associations of baseline factors with days alive and out of the hospital in the 30 days after COVID-19 diagnosis
- **Definitions**:
  - **Day of diagnosis**: date of first positive SARS-CoV-2 RT-PCR test
  - **Lower respiratory tract infection (LRTI)**: clinically diagnosed LRTI with new abnormal exam findings, abnormal radiologic findings, or new oxygen support
  - **Household contact**: member of household with suspected or laboratory-confirmed COVID-19 diagnosis
  - **Community, non-household contact**: interaction with community member with a suspected or laboratory-confirmed COVID-19 diagnosis
  - **LTCF**: long-term care facility

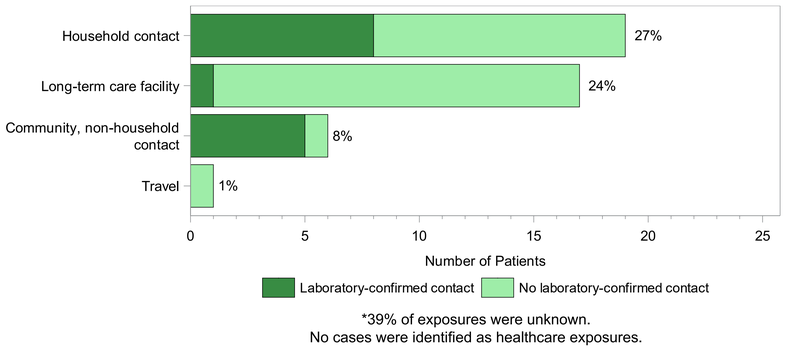
Results

Table 1. Baseline Demographics for COVID-19 Positive SCCA Patients

Baseline[1] Characteristic	Patients Testing Positive for COVID-19 (n = 71)[2]
Age (years), median (range)	61 (22 - 98)
Male	32 (45)
Race	
White	53 (75)
Black	6 (8)
Asian	5 (7)
Hawaiian/Pacific Islander	2 (3)
American Indian/Alaska Native	2 (3)
Multiple Races	1 (1)
Unknown	2 (3)
Ethnicity	
Hispanic	9 (13)
Non-Hispanic	60 (85)
Unknown	2 (3)
Body mass index (BMI)	
Less than 25	21 (30)
25-29.9	30 (42)
30 or greater	19 (26)
Unknown	1 (1)
Number of comorbidities	
0	18 (25)
1	13 (18)
2	21 (30)
≥ 3	19 (26)
Comorbidities	
Hypertension	32 (45)
Chronic kidney disease	15 (21)
Other malignancy	15 (21)
Coronary artery disease	11 (15)
Diabetes	9 (13)
Asthma	9 (13)
Heart failure	5 (7)
Other underlying lung disease	5 (7)
COPD	2 (3)
Other	30 (41)
Tobacco use	
Current & Former	34 (48)
Never	35 (49)
Unknown	2 (3)
Primary disease, broad category	
Solid tumor	42 (59)
Hematologic malignancy	19 (27)
Hematologic disorder	4 (6)
Inherited immunodeficiency	1 (1)
Autoimmune disorder	1 (1)
Other	4 (6)
Primary disease, specific[3]	
Breast cancer	10 (14)
Other solid tumor	6 (8)
Colorectal cancer	5 (7)
Prostate cancer	5 (7)
Non-Hodgkin lymphoma	5 (7)
Other heme malignancy	4 (6)

[1]Baseline defined as date of first positive COVID-19 test
[2]Values are in n (%) unless otherwise specified.
[3]Only primary diseases with frequency of at least 5% are shown

Figure 1. Distribution of COVID-19 Exposures*



*39% of exposures were unknown.
No cases were identified as healthcare exposures.

Figure 2. Frequency of Symptoms at COVID-19 Presentation Among 71 Patients

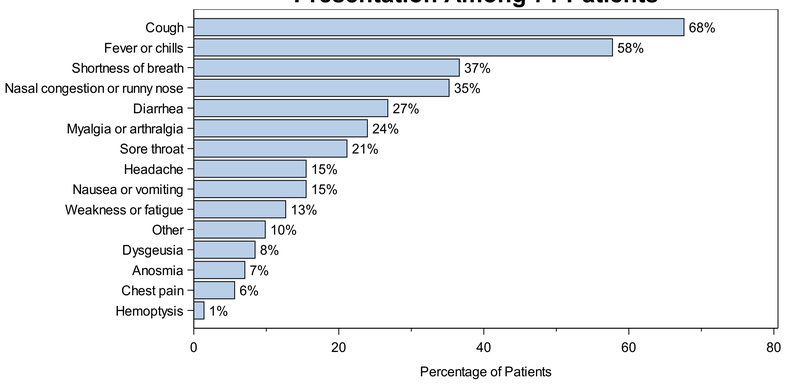
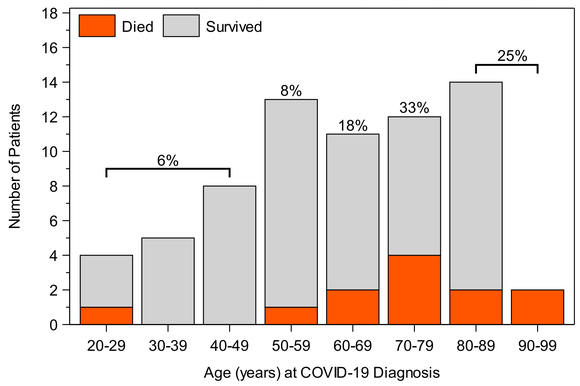
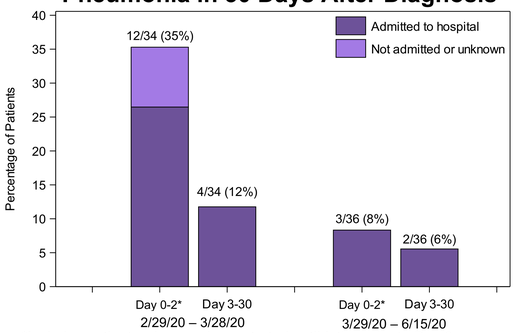


Figure 3. 30-Day Mortality by Age Group*



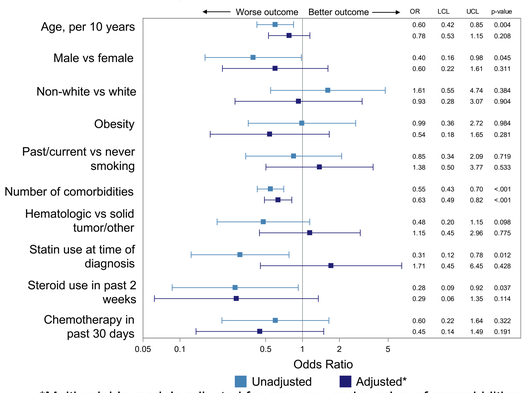
Percentages signify 30-day mortality rates for each age group
*Two deaths were not thought to be directly attributable to COVID-19: one 24-year-old and one 72-year-old

Figure 4. Empiric Antibiotic Use for Pneumonia in 30 Days After Diagnosis



*Includes patients who may have started antibiotics prior to Day 0.
Three patients had a documented respiratory coinfections. No viral or fungal copathogens were reported. One patient diagnosed with parainfluenza is not included as it was not possible to determine whether the parainfluenza or COVID-19 infection came first.

Figure 5. Model estimates for associations with days alive and out of hospital



*Multivariable models adjusted for age, sex, and number of comorbidities
OR = odds ratio, LCL = lower limit for 95% confidence interval, UCL = upper limit for 95% confidence interval

Conclusions

- COVID-19 is associated with significant morbidity and mortality in cancer patients, particularly among older age groups.
- More than half of cases appeared to acquire SARS-CoV-2 from LTCF or household exposures, indicating need for infection prevention and family/caregiver education.
- Despite few documented coinfections, empiric antibiotic use for pneumonia was common within 30 days of diagnosis early on in the pandemic but decreased over time.
- Greater number of comorbidities is significantly associated with lower odds of days alive and out of hospital in the 30 days after COVID-19 diagnosis