Clinical outcomes of SARS-COV-2 on cancer patients and treatment options

Hee Hwang, PharmD Candidate
Dongwon Shin, PharmD Candidate

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Background

- SARS-CoV-2, more often called as 'COVID-19', first emerged in the year of 2020 and has become a significant threat to the world even to this day. Consequently, it has had a huge impact on all parts of our lives. Not only did it change our daily routine, but it also imposed threats to patients who need regular hospital visits or those admitted inpatient for their cancer treatment.

Objectives

- The objective is to gather information through analytical and observational studies to assess if cancer patients are more susceptible to COVID-19 and if they have higher risks of developing severe outcomes such as mechanical ventilation, ICU admission, or in severe cases, mortality. The objective further extends to understanding if there is a correlation, if there is, what are some of the possible reasons for a correlation, and possible vaccinations and treatment options for SARS-CoV-2 or COVID-19 that can be concurrent with cancer treatment.

	Total *n* (%)	Hydroxy-chloroquine (*n* = 538)	Azithromycin (*n* = 485)	Remdesivir (*n* = 124)	Cortico-steroids (*n* = 109)	Tocilizumab (*n* = 94)	Other COVID-19 treatments[b] (*n* = 90)	No treatment (*n* = 1,321)
Age								
<65	956 (44)							
65–74	559 (26)							
75+	671 (31)							
Race/ethnicity								
Non-Hispanic white	1115 (51)							
Hispanic	334 (15)							
Non-Hispanic Black	476 (22)							
Other	200 (9)							
Region of patient residence								
U.S.-Northeast	1011 (46)							
U.S.-Midwest	597 (27)							
U.S.-South	275 (13)							
U.S.-West	303 (14)							
Comorbidities								
Obesity	705 (32)							
Diabetes mellitus	643 (29)							
Hypertension	1258 (58)							
Pulmonary	471 (22)							
Cardiovascular	709 (32)							
Renal	389 (18)							
Malignancy type[a]								
Solid tumors	1781 (81)							
Hematologic malignancies	470 (22)							
ECOG performance status								
0	749 (34)							
1	563 (26)							
2+	352 (16)							
Cancer status								
Remission/NED	1115 (51)							
Active, stable/responding	607 (28)							
Active, progressing	239 (11)							
Baseline COVID-19 severity								
Mild	1037 (47)							
Moderate	876 (40)							
Severe	273 (12)							

≥16% above average for category
+11% to +15% above average for category
+6% to +10% above average for category
+1% to +5% above average for category
Average for a category
−1% to −5% below average for category
−6% to −10% below average for category
−11% to −15% below average for category
≤16% below average for category

Methods

- Data was collected through keywords search including [COVID-19], [SARS-CoV-2], [oncology], [cancer], and [mortality] on PubMed and Embase.
- Systematic review articles exploring cancer patients, their outcomes with COVID-19, and possible treatment options were obtained through PubMed literature search.
- Cohort studies and systematic review articles were selected, as they demonstrate a larger population of cancer patients' overall risks, outcomes and possible treatments with a risk of COVID-19 than that of other research conducted. In addition to that, the articles include already published studies involving various types of cancer.
- Guidelines for COVID-19 vaccination were also included to assess risk and benefit and guidelines for administration of COVID-19 vaccines for cancer patients.

Limitation

- Since COVID-19 was such a recent, significant development, the data for these studies was collected with a high urgency. Consequently, the follow-up times were not long enough and the data was not complete.
- Most of the studies were observational or systemic reviews, so the authors did not have complete control over the study population and did not have any intervention in the studies.

Conclusion

- Cancer patients were shown to have higher risks of severe outcomes than the general population.
- Treatments utilized to treat cancer patients include hydroxychloroquine + azithromycin, hydroxychloroquine, azithromycin, remdesivir, hydroxychloroquine + high dose corticosteroids, etc. (Rivera et al., 2020)
- Re-examination of already approved antiviral medications was made. Through investigation of affinity and selectivity of these medications, potential combinations that have anti-inflammatory properties such as JAK inhibition to reduced elevated cytokine levels in patients with COVID-19. suggestions made for treatment options to be effective against COVID-19 for cancer patients include sunitinib, erlotinib, sirolimus + dactinomycin, mercaptopurine + melatonin, toremifene +emodin. (Moujaess, E., Kourie, H. R., & Ghosn, M, 2020)
- It is recommended by National Comprehensive Cancer Network that cancer patients receive COVID-19 vaccines, especially up to the 3rd dose for Pfizer/BioNTech.

Discussion

- All-cause mortality among patients with cancer infected by COVID-19 were higher than those in general population
- There were higher incidences of severe outcomes with cancer patients who were infected of COVID-19 than those of noncancer patients
- Most utilized treatments observed in practice settings were: hydroxychloroquine + azithromycin, hydroxychloroquine, azithromycin, remdesivir, hydroxychloroquine + azithromycin + high dose corticosteroids, etc. (Rivera et al., 2020)
- Among the utilized treatments, hydroxychloroquine with other treatment showed increased risk of mortality while remdesivir alone showed decreased 30-day mortality along with reduced severity of COVID-19 symptoms and duration.
- Some of the articles demonstrated conflicting opinions on whether receiving recent chemotherapy influenced severity and end results of COVID-19. This could be attributed to the varying methodology among trials as well as different locations where the trials were conducted.
- National Comprehensive Cancer Network recommends cancer patients receiving chemotherapy, targeted therapy, radiation or immunotherapy to get COVID-19 vaccine in order to decrease risks of COVID-19 illness, except for those receiving CAR-T cell therapy or stem cell transplant. With Pfizer/BioNTech vaccines, cancer patients are recommended to get up to a 3rd dose.
- Due to the limited population that has been affected by both cancer and COVID-19, and the high mortality rate of early COVID-19 infection, the results may be skewed. Further studies conducted with larger study populations may be required for more accurate findings.

References

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5. Figure 2. Heat map of selected clinical factors stratified by treatment exposures. From "COVID-19 and Cancer Consortium (2020). Utilization of COVID-19 Treatments and Clinical Outcomes among Patients with Cancer: A COVID-19 and Cancer Consortium (CCC19) Cohort Study." by Rivera, D. R., Peters, S., Panagiotou, O et al. Retrieved on September 25, 2021 from https://doi.org/10.1158/2159-8290.CD-20-0941
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