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Mortality rate in cancer patients with COVID-19: meta-analysis data

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Abstract

Coronavirus Disease (COVID-19), that begun from Wuhan, China and spread rapidly and to worldwide. Since, cancer patients are more susceptible to different types of infection with have higher risk of severe symptoms of COVID-19 than patients without cancer.

The objective of this study is determine mortality rate in cancer patients with COVID-19 through used systematic reviews and Meta-Analyses by searched COVID-19, cancer patients, mortality rate patients with cancer, mortality rate patients with COVID-19. In order to collect the data, valid databases (i.e., MEDLINE, ISI Web of Science, PubMed, EMBASE, Scopus, Google Scholar, and Science Direct) were systematically searched. Five hundred and forty-five (545) studies were identified on valid databases (electronic literature search) were screened by title, abstract and full-text articles were identified for eligibility. Seven study data of patients with severe COVID-19 reported higher mortality among patients with hematologic versus those with non-hematologic cancers (79.9% v 55.6%), and no difference in mortality among cancer + COVID-19 patients with comorbidity compared with those without any comorbidity (33.1% v 33.6%).

In conclusion; patients with cancer and COVID-19 had a significantly higher risk of mortality outcomes then patients with COVID-19 without cancer. Doctors and other medical staff must be tolerated take care with cancer patients in the COVID-19 visitors.

Keywords: Cancer, COVID-19, Mortality rate, Systematic reviews

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Introduction

In the last two decades, SARS-CoV and MERS-CoV have caused epidemics with mortality rates of approximately 9.5% and 34.4%, respectively [1, 2]. The third highly epidemic disease to be detected, with a lower mortality rate than SARS and MERS is coronavirus Disease (COVID-19), that begun from Wuhan, China and spread rapidly and to worldwide [3]. Currently at time of this

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write manuscript (February 09, 2021), the cumulative number of confirmed cases worldwide is 430,820,196 [4]. Most recent studies have shown that COVID-19 patients with many interfered with immunity, such as metastatic malignancies, renal disease, cardiac disease, chronic respiratory disease, endocrinopathies, many chronic neurological diseases are more to have bad prognosis [5].

Zhao Y, published that the existence of the COVID-19 pandemic also affects and increases various risks in individuals with chronic diseases, of the 1,590 cases of COVID-19 in 575 hospitals in 31 provinces of China, 399 cases were reported to have comorbid diseases. The most common comorbidity found was hypertension with 269 people (16.9%), followed by cardiovascular and cerebrovascular diseases with 59 (3.7%) and 30 (1.9%), respectively. Meanwhile, cancer was also found in 18 (1.1%) of 1,590 people [6].

Cancer is a major public health problem that seriously threatens the health of the global population due to population ageing [7]. There were 19.3 million new cases of cancer in 2020 and this number of new cancer diagnoses is expected to triple by 2050 worldwide and 608,570 Americans people will die from cancer in the end of 2021, corresponding to more than 1600 deaths per day [8, 9]. This increase will challenge already strained healthcare systems worldwide. Many clinical finding in humans and animal studies support the research theory that immunologic surveillance plays critical role in decrease the development of malignancies [10, 11].

Since, cancer patients are more susceptible to different types of infection with have higher risk of severe symptoms of COVID-19 than patients without cancer because of their effects immunosuppressive states caused by malignancies and chemotherapies (12-15). Recent studies have demonstrated that cancer enhances susceptibility to COVID-19 and is a risk factor for worse clinical outcomes among patients with COVID-19 and patients admitted to the intensive care unit, patients requiring ventilation, or patient death. [16].

In this study, we conducted a systematic review that included many published papers from USA, China, UK, France, Italy, Switzerland, South Korea, Spain, Asia, and Germany to determine mortality rate of COVID-19 patients with malignancies.

Patients and Method

This study was reported based on the systematic reviews and Meta-Analyses guidelines. A number of key terms were searched including; COVID-19, cancer patients, mortality rate patients with cancer, mortality rate patients with COVID-19. In order to collect the data, valid databases (i.e., MEDLINE, ISI Web of Science, PubMed, Cochrane Library, EMBASE, Scopus, Google Scholar, and Science Direct) were systematically searched. All published data studies were in English including both retrospective and prospective cohort studies, case-control studies, and

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case series were included adult patients (age ≥ 18 years) with cancer and COVID-19 and prognosis.

Results

From the results of literature searches up to November 31, 2020 using MeSH words predetermined, five hundred and forty-five (545) studies were identified on valid databases (electronic literature search). After removing six studies due to the duplicates, 539 studies were screened by title, abstract and full-text articles were identified for eligibility. Reasons for exclusion can be identified in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses chart. Regarding the basis of overlapping study duration and hospital location, a decision was taken to include only the most recent study.

There were 9 studies from China with potentially overlapping patients in the meta-analysis for studies reporting mortality in cancer patients with COVID-19 and have severe clinical finding leading to admitted to the ICU [17].

Furthermore, seven study data of patients with severe COVID-19 reported higher mortality among patients with hematologic versus those with non-hematologic cancers (79.9% v 55.6%). Also, this systematic reviews and Meta-Analyses showed that there was no difference in mortality among cancer + COVID-19 patients with comorbidity compared with those without any comorbidity (33.1% v 33.6%) except in patients with cardiac and pulmonary complications showed increased prevalence in cancer + COVID-19 against cancer + COVID-19 in with non-cardiac and pulmonary complications (41.1% v 29.4%).

Discussion

Cancer is a major public health problem worldwide and the COVID-19 pandemic continues, understanding the clinical outcomes of patients with cancer and COVID-19 become critically important. There is some unclear resulted data about the strength of evidence, research published articles suggest that cancer patients are more vulnerable to COVID-19 infection than the general population, perhaps due to their immunocompromised state [18-21]. This systematic review analyzed the results of high-quality studies regarding the mortality rate in cancer patients with COVID-19. Our data analysis explained that the mortality in cancer patients with COVID-19 were higher in patients with hematologic cancers and 68% admitted dead in ICUs who have severe COVID-19 compared with COVID-19 patients without cancer where 35%.

Several studies have reported that cancer is a risk factor for COVID-19 patients, which could lead to unfavorable clinical outcomes [22-27]. While other study reported that the death rates of COVID-19 did not differ significantly between the population with and without cancer because of the low percentage of treatment-related adverse events. Retrospective cross-sectional study found that cancer patients have a two-fold higher COVID-19 infection rate in comparison to the

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general population (0.79% and 0.37%, respectively, odds ratio [OR] 2.31, 95% CI 1.89–3.02) [28].

Another study reported that the percentages of severe events in breast cancer patients with COVID-19 were the same as the general population, which might be related to the implementation of much stricter social distancing procedures by cancer patients [29-31]. Therefore, it is necessary to conduct a comprehensive meta-analysis to identify the relationship between cancer and COVID-19 [32]. A meta-regression was also performed on mortality and found that sex was the source of heterogeneity, which could be related to different sex compositions among different countries. Other resulted data confirmed that men were found to be at a significantly increased risk of severe infection and COVID-19-related death and this appears to be a frequently observed association for the general population, not only for cancer patients [33].

Conclusions

This large sample size meta-analysis data study found that patients with cancer and COVID-19 had a significantly higher risk of mortality outcomes then patients with COVID-19 without cancer. Doctors and other medical staff must be tolerated take care with cancer patients in the COVID-19 visitors.

Competing interests

The author declare that he has no competing interests.

References

1. Mohamadian M, Chiti H, Shoghli A, Biglari S, Parsamanesh N, Esmaeilzadeh A. COVID-19: Virology, biology and novel laboratory diagnosis. J Gene Med. 2021; 23(2): e3303.
2. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72? 314 cases from the Chinese Center for Disease Control and Prevention. JAMA. 2020; 323(13): 1239-1242.
3. Yang L, Chai P, Yu J, Fan X. Effects of cancer on patients with COVID-19: a systematic review and meta-analysis of 63,019 participants. Cancer Biol Med. 2021; 18(1): 298-307.
4. Oh WK. COVID-19 infection in cancer patients: early observations and unanswered questions. Ann Oncol. 2020; 31(7): 838-839.

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5. Contini C, Di Nuzzo M, Barp N. The novel zoonotic COVID-19 pandemic: An expected global health concern. J Infect Dev Ctries. 2020;14(3): 254-264.
6. Guan WJ, Liang WH, Zhao Y, et al. Comorbidity and its impact on 1590 patients with COVID-19 in China: a nationwide analysis. Eur Respir J. 2020; 55(5): 2000547.
7. Harapan H, Itoh N, Yufika A, et al. Coronavirus disease 2019 (COVID-19): a literature review. J Infect Public Health. 2020; 13: 667-73.
8. Xia Y, Jin R, Zhao J, Li W, Shen H. Risk of COVID-19 for patients with cancer. Lancet Oncol. 2020; 21: e180.
9. Li LQ, Huang T, Wang YQ, Wang ZP, Liang Y, Huang TB, et al. COVID-19 patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis. J Med Virol. 2020; 92: 577-83.
10. Liu C, Zhao Y, Okwan-Duodu D, Basho R, Cui X. COVID-19 in cancer patients: risk, clinical features, and management. Cancer Biol Med. 2020; 17: 519-27.
11. Addeo A, Friedlaender A. Cancer and COVID-19: unmasking their ties. Cancer Treat Rev. 2020; 88: 102041.
12. Katopodis P, Anikin V, Randeva HS, et al. Pancancer analysis of transmembrane protease serine 2 and cathepsin L that mediate cellular SARSCoV2 infection leading to COVID-19. Int J Oncol. 2020; 57: 533-9.
13. Yang F, Shi S, Zhu J, Shi J, Dai K, Chen X. Clinical characteristics and outcomes of cancer patients with COVID-19. J Med Virol. 2020; 92: 2067-73.
14. Ganatra S, Hammond SP, Nohria A. The novel coronavirus disease (COVID-19) threat for patients with cardiovascular disease and cancer. JACC Cardio Oncol. 2020; 2: 350-355.
15. Gold JAW, Wong KK, Szablewski CM, et al. Characteristics and clinical outcomes of adult patients hospitalized with COVID-19 – Georgia, March 2020. MMWR Morb Mortal Wkly Rep. 2020; 69: 545-50.
16. Goyal P, Choi JJ, Pinheiro LC, et al. Clinical characteristics of COVID-19 in New York city. N Engl J Med. 2020; 382: 2372-4.
17. Yang K, Sheng Y, Huang C, et al. Clinical characteristics, outcomes, and risk factors for mortality in patients with cancer and COVID-19 in Hubei, China: A multicentre, retrospective, cohort study. Lancet Oncol. 2020; 21: 904-913.
18. Stang A. Critical evaluation of the Newcastle-Ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses. Eur J Epidemiol. 2010; 25: 603-5.
19. Desai A, Sachdeva S, Parekh T, Desai R. COVID-19 and cancer: lessons from a pooled meta-analysis. JCO Glob Oncol 2020; 6: 557-9.

Research Article doi: 10.18081/2333-5106/9.3/163

20. Zhang L, Zhu F, Xie L, et al. Clinical characteristics of COVID-19-infected cancer patients: a retrospective case study in three hospitals within Wuhan, China. Ann Oncol. 2020; 31: 894-901.
21. Yang K, Sheng Y, Huang C, et al. Clinical characteristics, outcomes, and risk factors for mortality in patients with cancer and COVID-19 in Hubei, China: a multicentre, retrospective, cohort study. Lancet Oncol. 2020; 21: 904-913.
22. Mehta V, Goel S, Kabarriti R, et al. Case fatality rate of cancer patients with COVID-19 in a New York hospital system. Cancer Discov. 2020; 10: 935-941.
23. Lee LYW, Cazier JB, Starkey T, et al. COVID-19 mortality in patients with cancer on chemotherapy or other anticancer treatments: a prospective cohort study. Lancet. 2020; 395: 1919-1926.
24. Mauri D, Kamposioras K, Tolia M, Alongi F, Tzachanis D. International Oncology Panel and European Cancer Patient Coalition Collaborators. Summary of international recommendations in 23 languages for patients with cancer during the COVID-19 pandemic. Lancet Oncol. 2020; 21: 759-760.
25. Richardson S, Hirsch JS, Narasimhan M, et al; the Northwell COVID-19 Research Consortium. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. AMA. 2020; 323(20): 2052-2059.
26. Yousif NG, Najah R, Yousif G, et al. Hematological changes among Corona virus-19 patients: a longitudinal study. Sys rev pharma. 2020; 11(5): 862-866.
27. Lee LY, Cazier JB, Angelis V, et al. UK Coronavirus Monitoring Project Team. COVID-19 mortality in patients with cancer on chemotherapy or other anticancer treatments: a prospective cohort study. Lancet. 2020; 395(10241): 1919-1926.
28. Yu J, Ouyang W, Chua MLK, Xie C. SARS-CoV-2 transmission in patients with cancer at a tertiary care hospital in Wuhan, China. JAMA Oncol. 2020; 6: 1108-1110.
29. Zhang L, Zhu F, Xie L, et al. Clinical characteristics of COVID-19-infected cancer patients: a retrospective case study in three hospitals within Wuhan, China. Ann Oncol. 2020; 31(7): 894-901.
30. Desai A, Khaki AR, Kuderer NM. Use of real-world electronic health records to estimate risk, risk factors, and disparities for COVID-19 in patients with cancer. JAMA Oncol. 2021;7(2): 227-229.
31. Kalinsky K, Accordino MK, Hosi K, et al. Characteristics and outcomes of patients with breast cancer diagnosed with SARS-Cov-2 infection at an academic center in New York City. Breast Cancer Res Treat. 2020; 182(1): 239-242.

Research Article doi:10.18081/2333-5106/9.3/163

32. Liang W, Guan W, Chen R, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. Lancet Oncol. 2020; 21(3): 335-337.
33. Gupta K, Gandhi S, Mebane A, et al. Cancer patients and COVID-19: Mortality, serious complications, biomarkers, and ways forward. Cancer Treat Res Commun. 2021; 26: 100285.

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