

The impact of COVID 19 pandemic on pattern of cancer mortality in Najran, Saudi Arabia: A single-cancer center experience

Cancer mortality during COVID 19

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Abstract

Aim: To explore the association between mortality and Covid infection, age, sex, site of cancer, stage, and the interval between the last dose of chemotherapy given within the last 30 days before death.

Material and Methods: Adult cancer patients who died of cancer in King Khalid Hospital in Najran -Saudi Arabia, were included in this retrospective observational study. We compared mortality patterns in a period of 6 months in 2020 (March to August) with the corresponding period of 2019.

Results: 50 dead adult cancer patients were included, 24 in 2019 and 26 in 2020. Among them, 21% vs 42% were younger than 65 years of age; 61% vs 62% were males, for the years 2019 & 2020 respectively. The top three killers in 2019 were colorectal, gastro-esophageal cancers, and hepatocellular carcinoma, while in 2020 were colorectal, hepatocellular carcinoma, and lymphomas. About 16.7% of patients died within 30 days of receiving anti-cancer treatment in 2019 in comparison with 7.7% in 2020. The difference in the 30-days mortality after receiving anti-cancer treatment was not statistically significant between 2019 and 2020 ($p=0.329$).

Discussion: The Year 2020, the time of the COVID-19 pandemic, was not associated with a significant increase in the short-term mortality among patients with malignancy in Najran, Saudi Arabia. Our results generally reflect the crucial role of strict preventive national measures in saving lives and warrants further exploration.

Keywords

COVID 19, SARS-CoV-2, Mortality, Malignancy, Cancer

DOI: 10.4328/ACAM.20778 Received: 2021-07-09 Accepted: 2021-08-20 Published Online: 2022-02-05

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Introduction

Cancer is the main barrier for improving life expectancy. Factors like aging and changes in lifestyle are the main risk factors associated with increasing incidence and mortality of cancer¹. Due to serious outcomes associated with COVID-19, it is expected to find higher levels of mortality in cancer patients than those in the normal population. Patients with cancer are usually susceptible to infectious diseases, and it is known that infections are a leading cause of death among this patient population². Cancer may result in a weakened immune system due to the negative effect on immune cells, affecting their quantity or quality, as is the case in leukemia or lymphoma. Cancer therapy itself, whether it is surgery, radiotherapy, or chemotherapy, disturbs the immune system in various ways and results in an increased risk of infection³. Globally, cancer is the second leading cause of death with over 10 million death in 2018 ^{4,5}. Patients with cancer are likely to have other comorbidities, whether due to age or exposure to cancer risk factors, such as smoking, obesity, and other lifestyle choices. Chronic diseases and comorbidities were identified previously as risk factors for COVID-19 mortality. All these factors lead to the predisposition of patients with cancer to a high risk of acquiring infectious diseases with a worse outcome than patients without cancer⁶. The first COVID-19 case was confirmed in Saudi Arabia on the the 2nd of March 2020. The total number of reported cases of COVID-19 has reached 357,872 cases, recovered 347,513, with 5,919 deaths (last updated the 2nd of December 2020). Whilst there are still no data available on COVID-19 cases by their age group and other demographic factors in Saudi Arabia, the lower mortality rate might be a reflection of the young population in the kingdom and the strict preventive national measures^{7,8}. The aim of this paper is to describe the pattern of cancer mortality in Najran region during the COVID-19 pandemic and to explore the association of cancer mortality during Covid pandemic with age, sex, site and stage of cancer, and the interval between the last dose of chemotherapy given within the last 30 days before death.

Material and Methods

Adult cancer patients who died of cancer in King Khalid Hospital in Najran Saudi Arabia, irrespective of the cancer stage and treatment type, were included in this retrospective observational study. The target population included adults aged ≥ 18 years who were histologically diagnosed with cancer, irrespective of the cancer stage, and class of anti-cancer treatment received, aiming to explore the association with age, sex, site of cancer, stage, and the interval between the last dose of chemotherapy given within the last 30 days before death. Cases with non-histologically confirmed diagnosis with cancer, or have incomplete record were excluded. The hospital was following the preventive measures as recommended by the ministry of health including the contact precautions, emergency department triage for probable cases, isolation in the wards and Intensive care unit and staff biweekly home-isolation to limit the exposure. We selected the start date of March 2020 in concordance with the announcement of the first confirmed COVID-19 case

in Saudi Arabia, while the end date was August 31 2020 in concordance with the drop of the cases and resumption of the near-normal life. We compared these 6 months in 2020 (March to August) with the corresponding period of 2019. Data were extracted from the electronic medical records based on the monthly mortality report for the medical department. Patient data confidentiality was maintained, and the declaration of Helsinki was followed.

Results

50 dead adult cancer patients were included, 24 in 2019 and 26 in 2020. Among them, 21% vs 42% were younger than 65 years of age; 61% vs 62% were males, for the years 2019 & 2020 respectively. Regarding the metastatic stage, 91% vs. 85% for the years 2019 & 2020 respectively. The leading causes of death in 2019 were colorectal, gastro-esophageal cancers, and hepatocellular carcinoma, while in 2020 were colorectal, hepatocellular carcinoma, and lymphomas (figure 1). About 16.7% of patients died within 30 days of receiving anti-cancer treatment in 2019 in comparison with 7.7% in 2020. The difference in the 30-days mortality after receiving anti-cancer treatment was not statistically significant between 2019 and 2020 (p=0.329). The main direct cause of death in the two years was cancer progression (figure 2) , while COVID-19 was the direct cause in only 3% of the cases (figure 3).

Table 1. Shows the relationship between mortality, age, sex, stage and the chemotherapy administration in the last 30 days

	2019	2020
Total deaths	24	26
Mortality rate according to gender		
Male	61%	62%
Female	39%	38%
Mortality Rate among cancer patients aged < 65-year-old	21%	42%
Mortality Rate among cancer patients with metastasis	91%	85%
% Of Chemotherapy recipients in the last 30 days	16%	8%

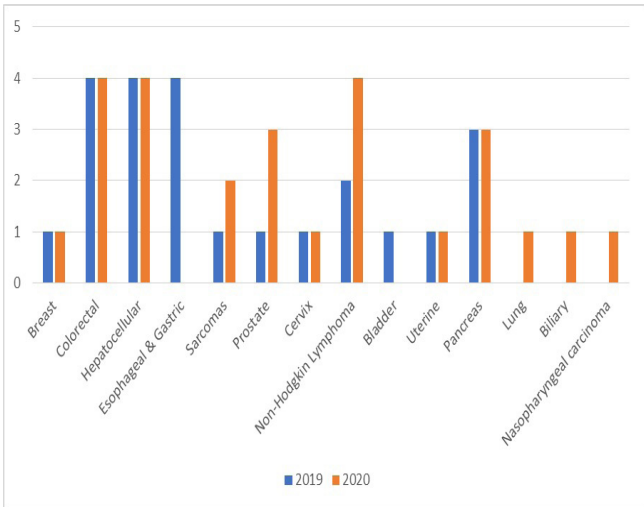


Figure 1. Mortality rate according to the type of Cancer

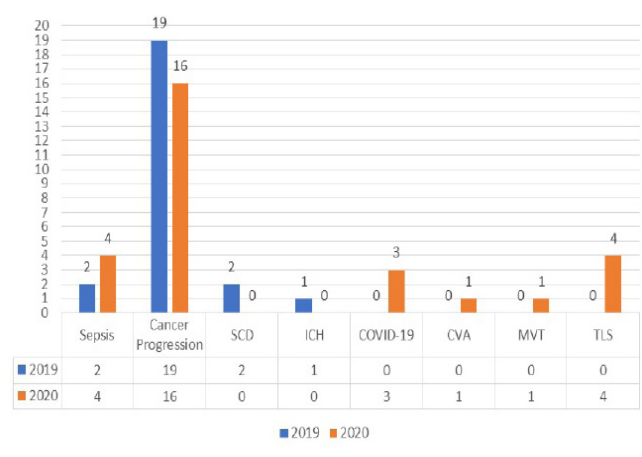


Figure 2. Causes of death among Cancer patients (2019-2020)

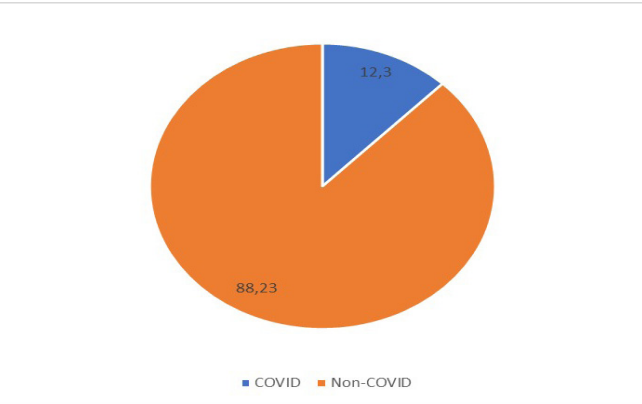


Figure 3. COVID Mortality in comparison to Non-COVID mortality

Discussion

To the best of our knowledge, this study is the first trial evaluating the effect of the COVID-19 pandemic on cancer patients in Najran- Saudi Arabia9. Our study revealed a comparable mortality for cancer patients before and during COVID-19 pandemic. There is a doubling of the death risk in the year 2020 among patients younger than 65 (42% vs 21%), this can be explained by the death of two young lymphoma cases, including a case with tumor lysis syndrome complicated with hyperkalemia and another case that developed respiratory distress with rapid deterioration, but no positive COVID-19 testing was proved on them.

A Korean study revealed a death rate of 64% in patients with chronic comorbidities during the pandemic, including those with cancer. The low mortality among our patients can be explained by the implementation of extra precautionary measures to ensure that these vulnerable patients are not exposed to the virus10.

The limitation of our study is the small number of patients and the retrospective nature of the study design. Covid 19 testing was done only for the suspected cases as per the regulation of the ministry of health.

It is prudent to ensure that all possible precautionary measures be implemented to protect oncology patients from being exposed to Covid 19; developing additional protective measures, such as a vaccine, is important to prevent infection

in this vulnerable population. Developing effective antiviral treatment will help in saving the lives of affected patients11.

Conclusions

The Year 2020, the time of the COVID-19 pandemic, was not associated with a significant increase in the short-term mortality among patients with malignancy in Najran, Saudi Arabia. Our results generally reflect the crucial role of strict preventive national measures in saving lives and warrants further exploration.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Funding: None

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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How to cite this article:

Ahmed M. Badheeb, Mohamed A. Badheeb, Hamdi Alhakimi. The impact of COVID 19 pandemic on pattern of cancer mortality in Najran, Saudi Arabia: A single-cancer center experience. Ann Clin Anal Med 2022; DOI: 10.4328/ACAM.20778.