REVIEW ARTICLE

Impact of the COVID-19 Pandemic on Cancer Patients: Challenges and Practical Approach to Management

Uzma Azeem Awan, Rida Fatima Saeed, Muhammad Zeeshan Bhatti, Muhammad Naeem, Nosheen Akhtar

ABSTRACT

The coronavirus 2019 (COVID-19) outbreak has rapidly spread worldwide, which poses great challenges to the healthcare system around the world. This pandemic has shown that globally medical community has no care-models to deal with the effects imposed on patients with chronic illnesses. Appropriate and timely diagnosis and treatment of this highly vulnerable immunocompromised population is mandatory. Prominent challenges faced during the current outbreak include resource allocation, management of patients suffering from and follow-up-phases, patient fear and protection of healthcare workers. During Pandemic, the major management strategies for cancer patients comprise education about personal protective measures, symptoms of COVID-19, emotional support, clear communication about infection control measures and clinical care. To decrease the risk of exposure, active individualized cancer intervention is required with reduce outpatient visits and maximum telemedicine. Currently, international guidelines to manage cancer patients in any infectious pandemic are not available. The development of a complete contingency plan with guidelines for the safety and patients care will pose beneficial effects by minimizing the risks of morbidity and mortality.

Key Words: *Cancer, COVID-19, Management.*

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Introduction

The recent outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has affected life worldwide since December 2019.[1] Over the past two decades, coronavirus is the third major outbreak which affected the world globally.[2] No healthcare system was fully prepared for this unparalleled health crisis, which affected the treatment of many other common ailments due to tremendous strain in healthcare services.[3]

Cancer patients have been predominantly affected, as they are in a list of extremely vulnerable populations in the current COVID-19 pandemic, because of their immuno-compromised status.[4,5] Immuno-suppression from malignant disease or its treatment (chemotherapy, immunotherapy, radiotherapy, surgery, targeted therapy and hematopoietic transplantation) renders a higher risk of susceptibility to a potentially fatal infection. Some treatment modalities cause defects in immune system like chemotherapies reduces the function of T and B cells.[6,7] Infection with community respiratory virus severely affects individuals with a weak immune system, and this epidemic can be highly related to significant morbidity and mortality. These patients are at high risk for bacterial super-infection, decline in pulmonary function and resistance to antiviral therapy.[8,9] Basic and clinical cancer research is severely affected by the COVID-19 pandemic due to quarantine, working in shifts and lack of supplies. Despite these issues, researchers in oncology have published a decent number of studies on different aspects such as epidemiology, pathology, treatment modalities and management of the COVID-19 and cancer[10] (Figure 1).

Comparatively higher occurrence of pneumonia (66%) with thirty days mortality (18.5 %) in patients of cancer was reported in a retrospective study during the outbreak of influenza A virus in 2009.[11] Recently, a small case study demonstrated that

Department of Biological Sciences
National University of Medical Sciences, Rawalpindi
Correspondence:
Dr. Uzma Azeem Awan
Assistant Professor, Biological Sciences
National University of Medical Sciences, Rawalpindi
E-mail: uzma.awan@numspak.edu.pk

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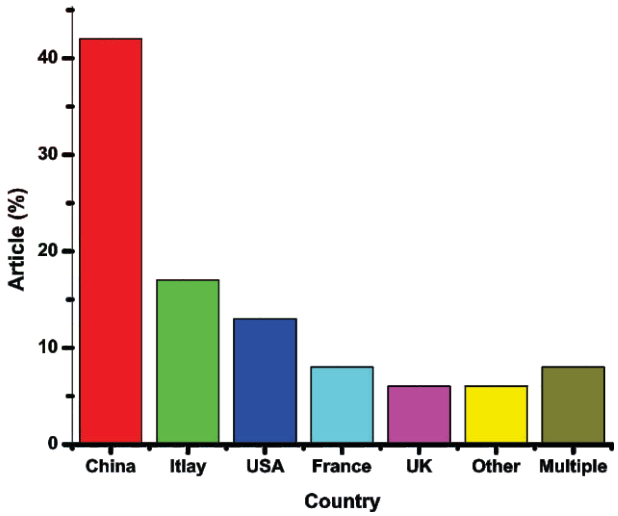

Fig 1: The percentage contribution of countries in publishing articles on COVID-19 and cancer. Data was adopted from Moujaess et al 2020.[10]

patients suffering from cancer were more susceptible to COVID-19 infection as compared to individuals without cancer. This is linked with risk of severity of COVID-19 i.e., invasive ventilation, admittance in the intensive care unit, and/or death in 39 % of cancer patients compare to 8% with no cancer.[9] In another study on 1524 oncology patients, the risk of COVID-19 infection was observed two-fold as compared to the general population.[12] A study documented by the Chinese Center for Disease Control and Prevention described that, out of 72,314 COVID-19 positive cases, 107 (0.5%) patients had active cancer, and among them, 6 expired. The case fatality was significantly higher (5.6%) in patients suffering from cancer than the reported fatality rate from COVID-19 (2.3%).[13] Likewise, the data from Italy showed increased case mortality in patients already suffering from other diseases as compared to patients without co-morbid conditions.[14] Patients suffering from cancer were at high risk of disease-related complications, especially if chemotherapy or surgery was executed within the month preceding COVID-19.[15]

In May 2020 two largest multicentre studies published in *The Lancet* journal highlighted the COVID-19 impact on patients suffering from cancer in terms of the high mortality rate. In the initial study, researchers from the US-COVID-19 and Cancer Consortium (CCC19) collected data from 928 adults with confirmed COVID-19 infection and active or previous malignancies. The study was executed from March 17th through April 16th; data included baseline clinical conditions, COVID-19 disease course, medication, cancer diagnosis and intervention. Out of the 928 patients, the median age was 66 years, half of the patients were male, the most frequent malignancies were breast cancer (21%) and prostate cancer (16%) and 39% of patients were on active anticancer treatment. The results of this study showed a higher death rate (13%), which was linked with male sex, age, active cancer, smoking status and receipt of hydroxychloroquine plus azithromycin (increased risk of death), but not with anticancer therapy.[16]

In the second study, the UK Coronavirus Cancer Monitoring Project (UKCCMP) reported data on 800 cancer patients suffering from COVID-19. The study showed that death risk of 28% of patients was considerably linked with the presence of comorbidities, age and male sex. There was no interaction between COVID-19 morbidity or mortality and anticancer therapy was reported.[17]

In both studies, the high rate of death was found in male patients and was significantly correlated with other comorbidities existence such as cardiovascular diseases and age (older patients). It was also found that obesity, ethnicity and race, and cancer treatment such as chemotherapy had no risk effect on the fatality rate in either research.

A multicenter study of 105 patients affected by COVID-19 and cancer showed that lung (22), gastrointestinal (13), breast/thyroid (11), blood (9), cervical and esophageal cancers (6). They found that hematologic cancer, lung cancer or stage IV cancer patients were more susceptible to the COVID-19. Furthermore, COVID cancer patients were to be expected to have a severe illness (34%), ICU admitted (19%) or on ventilator (10%). The findings of this study exhibit that cancer patients appear to be more vulnerable to COVID-19 outbreak.[18]

Robilotti et al studied data of 432 COVID 19 positive cancer patients treated in New York City and reported robust link between hematological malignancy and the hospitalization risk of analyzing 423 COVID-19.[19] Sever mortality rate has been documented in a cohort study of COVID-19 positive patients with hematological cancer (128) compared with 226 COVID-19 positive non-cancerous

patients.[20] Furthermore, a high death rate in multiple myeloma patients (54.6%) and lung cancer (25%) with COVID-19 have been shown in UK[21] and New York[22] institutions. From these studies, it can be suggested that COVID-19 is correlated with a significant burden of severity in hematological and lung cancers with overall high death rates.

We used the search key words such as "COVID-19 and cancer", "COVID-19 and tumor" or "malignancies", "cancer patients and COVID-19" ,"impact of COVID-19 on cancer patient" to get relevant literature from PubMed, Google scholar and Web Science from July 2020 to September 2020. We did not restrict this review to any specific type of tumor.

Challenges

Lack of Resource Allocation and access to healthcare services

The available resources and funds to respond accordingly is a principal challenge for pandemic preparation. Strong teams of oncologist and hematologist are necessary to warrant implementation of contingency plans, which could protect health and balance risks of the care workers and patients.[23] Effective strategies need to be designed to reduce interruption of cancer treatment. To stimulate social distancing and to reduce the workload during the current pandemic, non-emergency surgeries and outpatient clinics are recommended.[24,25,26] The COVID-19 pandemic has potentially disrupt the supply chains of the medical product, and in case of cancers, where few treatments are preferred or no alternatives therapeutics exist, the shortage of cancer drug could be life-threatening.[27] Federal Drug Authority (FDA) has recently listed drug shortages of twenty six cancer medications.[28]

For the management of drug shortages, clear communication between suppliers, stakeholders, and health organizations and the identification of alternative substitute therapies are an immediate need. Imposed quarantine has delayed scheduled appointments and continuity of care for the cancer patient, which has led to severe complications. Due to lack of access to the required healthcare system, severe cases were reported in emergency among patients with advanced cancers.[29] Shortage of personal protection equipment (PPE) limited the contact of health care worker with cancer patients. This raises the alarms of asymptomatic cases and the exposure of susceptible cancer patients to COVID-19 infection. Lockdown measures have also caused delays in essential documentation required for sustainability of treatment such as renewal of insurance paperwork, closure of roads, or airports.[30]

Cancer diagnosis and treatment

During the current pandemic, timely diagnosis and appropriate treatment of patients has been extremely compromised.[31] The need and increased risk of any treatment should be balanced and evaluated on the individual basis taken into the account the urgency and the effect on the outcome of patients. It is also suggestive to defer immunosuppressive treatments like stem cell transplantation if possible.[32] Oral medication should be preferred to minimize the frequent visits of this vulnerable population.

Patient Fear and Protection of health care workers

Almost two-thirds of patients delayed chemotherapy due to fear of entering a hospital and contracting the virus.[33] In addition to these fears is the spread of the COVID-19 misinformation or excess information that overwhelmed cancer patients.[34,35]

Psychological impact upon COVID-19 positive cancer patients

Social distancing measures have deeply affected the COVID-19 cancer patients. Information on the higher risk of serious complications, the potential healthcare capacity issues and possible delays in the treatment of their disease, are the contributing factors. The outbreak has prompted distress and anxiety, which further contributes to disease severity in cancer patients. Sense of connection and strength has been limited due to visitor restrictions consequently, this lack of family support and advocacy negatively affect the well-being of cancer patients.[36]

COVID-19 and cancer care in Pakistan

According to the GLOBOCAN 2018, each year 170,000 to 200,000 new cases of cancers are estimated in Pakistan.[37] Approximately 45,000 new cancer patients come to the Shaukat Khanum Memorial Cancer Hospital and Research Centers in Peshawar and Lahore per annum for the treatment of cancer.[38] The government of Pakistan has taken all the necessary measurements to protect against

COVID-19. This includes social distancing, isolation, quarantine, tracing and tracking the positive patients and contacts.[39,40] In case of hospitals, special units have been specified for admission and isolation of patients. During the lockdown, there has been a suspension of clinical activity and registration of new cancer patients or follow-up visits whereas treatments such as chemotherapy and radiotherapy and emergency surgeries were continued at the time of quarantine.[38]

Management and recommendations during COVID-19

The first step in the management of cancer during the COVID-19 pandemic is addressing patients' concerns while ensuring well-being of both care providers and patients in a safe and effective environment. Patients needed to be encouraged to cope with stress, additional mental health services should be provided, where required. There is an increased need for efficient communication between oncologist and their patients.[41] Some important management strategies are given in figure 2. Recommended strategies include avoid admission, short stays in outpatient clinics and teleconsultaion. WHO recommendation for infection control measures, including frequent hand wash, keeping social distance, not to touch mouth, eye or nose, wearing protective mask, reinforce disinfection of surfaces and consulting doctors in case of cough, fever, difficulty in breathing and most importantly to stay in touch with the oncologist.[42] The duration of this outbreak is uncertain and in this situation the issue of continuity or termination of cancer therapy is debatable. Timely diagnosis and management are needed in case of solid tumors such as lung, pancreatic, high grade lymphoma, hematologic, and acute leukemia. Early-stage cancers including breast, cervical, prostate, and non-melanoma skin cancer treatments can be postponed during a pandemic.[43] In certain cases, surgery may be postponed on the recommendations of the concerned physicians.[44] It is essential to ensure that medical care is given to cancer patients without infecting the cancer patients with COVID-19.[45]

Conclusion and Future perspectives

In the current pandemic, oncology patients deserve special attention due to immunocompromised status. Evidence has shown that patients suffering

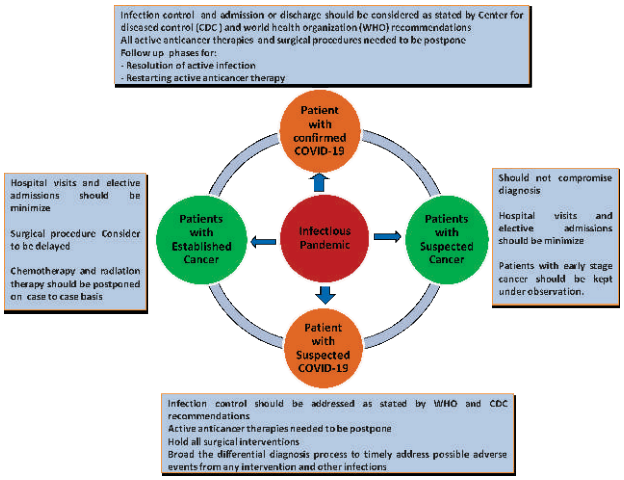

Fig 2: COVID-19 management strategies for cancer patients. Management strategies were adopted from AL-Shamsi et al 2020.[46]

from cancer are vulnerable to COVID-19 infection as compared to the general population. Globally, major challenges faced during the current outbreak include resource allocation, management of cancer patients and follow-up-phases, patient fear and protection of healthcare workers. Cancer therapies needed to be individualized on the bases of patient age, disease status, comorbidities, frailty and the potential of alternative strategies. Oral regimens with redefined administration intervals and postponement of cancer interventions such as surgery or chemotherapy could be considered for slow-progressing cancer patients. The major management strategies for cancer patients comprise education about personal hygiene and symptoms of COVID-19, emotional support, clear communication about infection control measures, changes to resource allocation and clinical care. Elective admission, minimizing outpatient visits and telemedicine can mitigate the risk of exposure and further transmission.

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