



RESEARCH ARTICLE

CORONAVIRUS DISEASE-19 OUTBREAK: IMPACT ON CANCER SURVIVORS AND CANCER CARE PROVIDERS

Dr. Payal Gonde^{1,*}, Dr. Vineeta Singh² and Dr. Abdulazim Junaidi³

¹Speciality Medical Officer, Department of Ophthalmology, Seth G S Medical College and Kem Hospital, Mumbai

²Assistant professor, Department of Community Medicine, Government Medical College, Chandrapur

³Lecturer, Department of Biochemistry, Tata memorial Hospital, Mumbai

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ABSTRACT

Coronavirus outbreak has affected thousands of people in at least 186 countries which has impacted the cancer care delivery system apart from affecting the overall health system adversely. Cancer patients are more susceptible to coronavirus infection than individuals without cancer as they are in an immunosuppressive state because of the malignancy and anticancer treatment. Countries must contain the foci of infection, isolate, test, treat and trace to control the coronavirus pandemic. There is a paucity of information on novel coronavirus infection and its impact on cancer patients and cancer care providers. To date, there is no scientific guideline regarding management of cancer patients in a background of coronavirus outbreak.

INTRODUCTION

The COVID 2019 (Corona Virus disease-2019) is an ongoing pandemic caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). The outbreak was identified in Wuhan, China, in December 2019 (WHO, 2020). The World Health Organization declared the outbreak to be a Public Health Emergency of International Concern on 30 January 2020, and recognized it as a pandemic on 11 March 2020 (WHO, 2020). As of 22 April 2020, more than 2.58 million cases of COVID-19 have been reported in 186 countries and territories, resulting in more than 178,000 deaths. More than 693,000 people have recovered (Coronavirus, 2020), although there may be a possibility of relapse or reinfection. Corona virus comprises of a large family of viruses that are common in human beings as well animals (camels, cattle, cats, and bats). There are seven different strains of coronavirus (National Center for Immunization and Respiratory Diseases). Sometimes corona virus from animals infect people and spread further via human to human transmission such as with MERS-CoV, SARS-CoV, and now with this COVID 19 (Corona disease 2019). The virus that causes COVID-19 is designated severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), previously, referred to as 2019-nCoV.

How does Person-to-person transmission occur?

Droplet transmission: The virus is released in the respiratory secretions when an infected person coughs, sneezes or talks.

These droplets can infect others if they make direct contact with the mucous membranes. Infection can also occur by fomites, touching an infected surface and followed by eyes, nose or mouth. Droplets typically do not travel more than six feet (about two meters) and do not linger in the air. However, given the current uncertainty regarding transmission mechanisms, airborne precautions are recommended routinely in some countries and in the setting of specific high risk procedures (Li et al., 2020). Patients are thought to be most contagious when they are symptomatic.

Epidemiology: Since the first reports of cases from Wuhan, at the end of 2019, more than 80,000 COVID-19 cases have been reported in China; including all laboratory-confirmed cases as well as clinically diagnosed cases in the Hubei Province. Increasing numbers of cases have also been reported in other countries across all continents except Antarctica. The rate of new cases outside of China has outpaced the rate in China which led world health organization (WHO) to declare COVID-19 as a pandemic. These numbers are changing every minute and incidence and mortality figures will be changed when this publication goes online.

Age affected

- Can affect any age but more common in middle aged (>30 years) and elderly.
- Symptomatic infection in children appears to be uncommon, and when it occurs, it is usually mild.⁶
- Clinical Presentation-

*Corresponding author: Dr. Payal Gonde,

Speciality Medical Officer, Department of Ophthalmology, Seth G S Medical College and Kem Hospital, Mumbai.

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In a study describing 1099 patients with COVID-19 pneumonia in Wuhan, the most common clinical features at the onset of illness were (Guan et al., 2019):

- Fever in 88%
- Fatigue in 38%
- Dry cough in 67%
- Myalgias in 14.9%
- Dyspnea in 18.7%

Pneumonia appears to be the most common and severe manifestation of infection. In this group of patients breathing difficulty developed after a median of five days of illness. Acute respiratory distress syndrome developed in 3.4% of patients.

Other symptoms

- Headache
- Sore throat, Rhinorrhea, anosmia
- Conjunctivitis
- Gastrointestinal symptoms

About 80% of confirmed COVID-19 cases suffer from only mild to moderate disease and nearly 13% have severe disease (dyspnea, respiratory frequency ≥ 30 /minute, blood oxygen saturation $\leq 93\%$, PaO₂/FiO₂ ratio < 300 , and/or lung infiltrates $> 50\%$ of the lung field within 24-48 hours). Critical illness (respiratory failure, septic shock, and/or multiple organ dysfunction/failure) is noted in only in less than 6% of cases.

People Who Are at Higher Risk for Severe Illness: Based on currently available information and clinical expertise, those at high-risk for severe illness from COVID-19 are:

- Age 65 years and older
- Who live in a nursing home or long-term care facility
- All ages with co-morbidities, particularly if not well controlled, including-
- Chronic lung disease or moderate to severe asthma
- Serious heart conditions
- Immunocompromised (cancer treatment, smoking, bone marrow or organ transplantation, immune deficiencies, poorly controlled HIV or AIDS, and prolonged use of corticosteroids and other immune weakening medications)
- Severe obesity (body mass index [BMI] of 40 or higher)
- Diabetes
- Chronic kidney disease undergoing dialysis
- Liver disease

Are cancer survivors immunocompromised?: Patients with history of cancer who are not currently on therapy and don't have active cancer are probably not at significantly increased risk compared to other people in their age group. The Higher risk is for people currently receiving immune suppressive treatment, as well as those who have active cancer and are not in remission.

Cancer patients are more susceptible to COVID-19 in future, than individuals without cancer because of their systemic immunosuppressive state caused by the malignancy and anticancer treatments, such as chemotherapy, targeted therapy and immunotherapy. They would include hematologic malignancies or blood cancer such as leukemia, lymphoma and myelodysplastic syndromes. A significantly higher incidence of severe events i.e. death or ICU admission requiring invasive ventilation among individuals with a cancer history than those without cancer history with COVID-19 (Liang, 2020). For those patients, both the treatment and the cancer itself affect body's natural defenses because the blood system is part of immune system. Cancer that are active and affecting a person's organ function are of concern—for example, patients with lung cancer may be at high risk for respiratory complications because they have underlying lung disease. The major risk for cancer patients is the inability to receive necessary medical services (both in terms of getting to hospital and provision of normal medical care once there) because of the outbreak. Cancer patients were estimated to have a 2-fold increased risk of COVID-19 in comparison to the general population. Hospital visit was a likely factor contributing to the increased incidence in cancer patients, but incidence of severe events was not higher than in the general population (Yu, 2020).

Immunity in Cancer: Inflammation acts at all stages of tumorigenesis. It may contribute to tumor initiation through mutation, genomic instability and epigenetic modifications. Inflammation activates tissue repair responses, induces proliferation of premalignant cells and enhances their survival. Inflammation also causes localized immunosuppression and promotes the formation of hospitable microenvironment in which pre malignant cell can survive, expand and accumulate additional mutations and epigenetic changes (Grivennikov, 2010). Tumour promoting cytokines act on immune and malignant cells to tilt the balance towards tumour promotion. Tumour promoting immunity dampens immunosurveillance. Infection fighting white blood cells also affected by chemotherapy, making a person more vulnerable to the virus (Dunn, 2004; Bui, 2007).

Role of Antiviral therapy (<https://link.springer.com/content/pdf/10.1007/s00134-020-05967-x.pdf>): At this time, there is no evidence or published guidelines regarding the use of prophylactic antiviral therapy for COVID-19 in immunosuppressed patients. Oseltamivir is not known to be effective in the treatment of COVID-19. Many clinical trials are ongoing on the use of potential antiviral medications (e.gremdesivir, lopinavir, and favipiravir). However, to date, none of these trials have been specified to cancer patients and all have been in patients with suspected or confirmed infection, and not in the prophylactic setting.

Recommendation regarding cancer screening: Patients are advised to postpone their planned cancer screening procedures for some time in which they are required to visit cancer centers. To ensure safety of high-risk group for Covid 19, medicines for chronic diseases can be issued/ indented in CGHS(Central Government Health scheme) wellness centers for a period of three months through authorized representative (Source, 2020).

Cancer patients on follow up: Cancer patients on regular follow up can avoid hospital visits. Patients must contact

Cancer Care Providers in case of contact history with coronavirus or having symptoms.

Extra Protection for Cancer patients (Source, 2020)

DO's

- Stay at home. Avoid meeting visitors at home. If meeting is essential, maintain a distance of one meter.
- Wash your hands and face at regular intervals with soap and water.
- Sneeze and cough either into your elbow or into tissue paper / handkerchief. After coughing or sneezing dispose of the tissue paper/ wash your handkerchief.
- Ensure proper nutrition through home cooked fresh hot meals, hydrate frequently and take fresh juices to boost immunity.
- Exercise and meditate.
- Take your daily prescribed medicines regularly.
- Talk to your family members (not staying with you), relatives, friends via call or video conferencing, take help from family members if needed
- Postpone your elective surgeries (if any)
- Clean the frequently touched surfaces with disinfectant regularly.
- Monitor your health. If you develop fever, cough and/or breathing difficulty immediately contact nearest health care facility and follow the medical advice rendered

DON'Ts

- Do not cough or sneeze into your bare hands or without covering your face.
- Don't go near your contacts if you are suffering from fever and cough.
- Don't touch your eyes, face, nose and tongue.
- Don't go near affected/ sick people.
- Don't self-medicate.
- Don't shake hands or hug your friends and near ones.
- Do not go to hospital for routine checkup or follow up. As far as possible make tele-consultation with your healthcare provider.
- Don't go to crowded places like parks, markets and religious places.
- Don't go out unless it is absolutely essential.

National Institute For health and Care excellence guideline (NG161) – Systemic cancer treatments:

Where decisions need to be made about prioritizing patients for treatment, these need to take into account the level of immunosuppression associated with individual treatments and cancer types, and any other patient-specific risk factors. They should also balance the risk from cancer not being treated optimally versus the risk of becoming seriously ill if they contract COVID-19 because of immunosuppression. Where changes need to be made to usual care because of system pressures, consideration should be given to delivering treatment in different and less immunosuppressive regimens, different locations, or via another route of administration.

COVID-19 and Cancer Care Providers: Cancer Care Providers i.e. doctors, nurses, technicians, caregivers, and all other allied professionals are at increased risk for coronavirus infection as chances of acquiring infection at workplace are

high. Thus, cancer care providers must report to the authorities, in case of drycough, fever, sore throat or in case of contact with someone with COVID-19. They need to be tested for COVID-19, followed by quarantine for 14 days or admission and treatment depending on the test results. Feeling under pressure and working under extreme circumstances are likely to be experienced by cancer care providers on many occasions. Extra work hours and sleepless nights in view of a large number of patients reporting to the hospital have become part of cancer care professionals. Stress and the panic associated with the current situation will be more evident in the near future, so managing mental health and psychosocial wellbeing during this time is as important as managing physical health. Cancer Care providers should follow standard precautions like hand and respiratory hygiene, use of PPE (personal protective equipment), safe waste management, disinfection and sterilization of equipment, etc. Ensure all patients should cover their mouth and nose if they cough or sneeze and maintain social distancing.

Prevention: Novel coronavirus is spread by people who have the virus coming in to contact with people who are not infected. The more you come in to contact with infected people, the more likely you are to catch the infection. Social distancing is infection control action that can be taken by public health officials to stop or slow down the spread of a highly contagious disease. In addition to social distancing measures taken by governments, we can ourselves choose to reduce physical exposure to potentially sick people, for example: Exploring the option to work from home if your job allows for it. Avoiding large public gatherings such as sporting events or situations where you may come in to contact with crowds of people. Interacting with people over the phone/video calls. A risk with a pandemic is that the initial spread is so quick that it overwhelms the health services. A key aim for any country should be to avoid that, and social distancing can help. General Protection steps for cancer care providers (WHO, 2020, March 20) (World Health Organization, 2020).

- Cancer Care providers should follow standard precautions like hand and respiratory hygiene, safe waste management, sterilization of equipment, etc.
- Ensure all patients should cover their mouth and nose if they cough or sneeze.
- Arrange separate rooms for admission of suspected COVID-19 cancer patients or keep at least 1-meter distance between beds in ward admissions.
- Cancer care providers should wear clean sterile, protective personal equipment.
- Limit the use of aerosol generator procedures for cancer patients like intubations.
- Use of screening questionnaire for the detection of suspected coronavirus cases.
- Perform hand hygiene after visiting every patient

CONCLUSION

To suppress and control the epidemic, countries must isolate, test, treat and trace. If this is not adopted, transmission chains can continue at a low level and then resurface once physical distancing measures are lifted. Cancer treatments, especially operations and chemotherapy, are riskier now than before. Cancer and its treatment can weaken the immune system.

In some cases, it may be safer to delay cancer treatment or give it in a different way, to reduce the risk from coronavirus. Any decisions about surgery and other treatments will be based on urgency and the level of risk. Most hospitals have started to use more telephone consultations as a way of helping people to avoid long waits in clinics and for treatment. Some patients may have their chemotherapy at home or have fewer radiotherapy appointments, to reduce visits to hospital while continuing with their treatment. Your safety is a priority in making any decisions. Some patients may start to see their treatment move to a different hospital as the National Health Services sets up 'cancer hubs' to coordinate treatment and ensure it can continue safely. The hubs will support hospitals across the National Health Services and independent sector to work together to maximize capacity and ensure that people receive the treatment that they need.

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