

Preparedness, Precaution and Practice of Radiotherapy during COVID-19 Pandemic- Radiotherapy Technologists Perspective

Kamala Chetia
Bhargab Sarma
GAUTAM SARMA

Dr. B. Borooah Cancer Institute
Dr. B. Borooah Cancer Institute
DR. B. BOROOAH CANCER INSTITUTE, GUWAHATI,
ASSAM

Shashi Bhushan Sharma
Papu Das

Dr. B. Borooah Cancer Institute
Dr. B. Borooah Cancer Institute

COVID-19 is a highly contagious virus and is transmitted from human to human respiratory droplets or coming in contact with a virus contaminated surface. Cancer patients are more vulnerable than general population to get infected with COVID-19 due to their immunosuppressed condition. Radiotherapy Technologists (RTTs) are among frontline healthcare providers who are at high risks of being exposed to COVID-19. RTTs are directly involved with treatment of cancer patients daily and also provide supporting roles in radiation safety, quality assurance education and training, administration research and service development. To cope with this present pandemic, RTTs would require prior preparation, precaution, judicious use of resources, clear communications and strong leadership. This article will help the RTTs to prepare themselves to tackle the present crisis and to carry out the radiotherapy practices in their respective hospitals.

Introduction

COVID-19 – a novel coronavirus was first detected in Wuhan City, Hubei Province of China in December 2019 [1]. The World Health Organisation (WHO) subsequently declared it as a pandemic on 11th March, 2020 [2]. COVID-19 is a highly contagious virus and is transmitted from human to human respiratory droplets or coming in contact with a virus contaminated surface [3]. As of 1st July, 2020, there were 10185374 cases detected and 503862 deaths reported globally. In South-East Asia, there were 784931 cases detected and 21593 deaths were reported [4].

Cancer is responsible for an estimated 9.6 million deaths in 2018. Globally, about 1 in 6 deaths is due to cancer. Approximately 70% of deaths from cancer occur in low- and middle-income countries [5]. Radiotherapy (RT) plays a pivotal role in the management of cancer treatment. More than 50 % of the cancer patients require radiotherapy in their course of illness [6-7]. Interruptions during the course of radiotherapy results in higher local disease recurrences and leads to poorer treatment outcomes [8]. Cancer patients are more vulnerable than general population to get infected with COVID-19 due to their immunosuppressed condition [3]. The radiation treatment machine is used to treat many patients in constant sequence daily. This raises the possibility of cross contamination among the patients and the health workers. Infection among the healthcare providers may lead to shrinking of workforce. Radiotherapy Technologists (RTTs) are directly involved with treatment of cancer patients daily and also provide supporting roles in radiation safety, quality assurance education and training, administration research and service development. To cope with this present pandemic, RTTs would require prior preparation, precaution, judicious use of resources, clear communications and strong leadership. This article will help the RTTs to prepare themselves to tackle the present crisis and to carry out the radiotherapy practices in their respective hospitals.

Precaution and Preparedness

Patient care

Precaution and Preparedness planning and policies is essential in order to respond effectively to the present crisis. These policies will help (a) to maintain adequate manpower in the department during the crisis (b) to maintain radiotherapy services of the patients (c) to reduce transmission of COVID-19 infection.

The general public safety measures recommended by national and international societies like avoidance of crowded places, maintaining social distance, wearing of face mask in public spaces and hand hygiene should be also followed by cancer patients.

Patients should be educated regarding prevention and transmission of COVID-19. Patients should be screened when entering the hospital entrance by checking their temperature and asking if they have any COVID-19 symptoms. In suspected cases appropriate triage and management should be taken. Patients should wear their own personal face masks even if they are asymptomatic. Patients should be inquired for presence of any symptoms related to COVID-19 infection. They should be also inquired if any of their family members is symptomatic. The risk of being infected by COVID-19 infection may further create panic in cancer patients who are already experiencing the severe psychological burden of having cancer. RTTs should continue to maintain effective communication channels with the patients. RTTs must reassure them that every safety measures are in place.

Machine Area and Console

Patients should be evenly distributed on all machines as much as possible to reduce overcrowding. RT timings of the patients on treatment should be staggered throughout the day to avoid crowding at the machine area. Latest updates and information related to COVID-19 infection, and steps to minimize the transmission etc. should be displayed in waiting areas to spread awareness among the patients and accompanying persons. Patients should be encouraged not to bring accompanying persons to the machine area unless absolutely essential. This will reduce gathering of people in the waiting area of the department. The face mask should be only removed during treatment of brain or head and neck cancers if required. Patients should be provided with hand sanitizers before entering and exiting the machine room. While waiting in the machine area, social distancing must be followed. As RTTs comes in contact with many patients daily, strict hygiene protocols must be followed in the machine area to minimize the risk of transmission of infection to other workers in the department and patients.

RTT Workflow

The role of RTT is indispensable in radiotherapy treatment. They come in direct face to face contact with the patients during the treatment. They also play a great role in advising patients on precautions to be taken during the course of radiotherapy. They also explain the patients about the expected side-effects of radiotherapy. RTTs are among frontline healthcare providers who are at high risks of being exposed to COVID-19. Strict protocols of personnel protection must be followed by RTTs during duty hours. Wearing of face shield and hand hygiene should be practiced by every worker in the machine room. These practices will minimize cross infection in the machine room. The RTTs and other workers of machine room should be split into teams with no crossover of staff from one team to another. One team should be assigned works in which they do not come in direct contact with patients. This team will be able to carry out radiotherapy services in case one of the team needs to be quarantined. RTTs must take special precaution like wearing eye goggles, sterile gown, face shield etc. while treating suspected patients of COVID-19 status. Same precautions must also be followed when treating patients with higher chance of droplet infection e.g. patients with

tracheostomy or with Ryle's tube. RTTs should wear full personal protection equipment (PPE) as per national or WHO recommendations for treating patients with confirmed COVID-19 status. Strict hygiene steps must be followed during donning and doffing of PPE. Confirmed COVID-19 status patients should be treated on a dedicated machine if possible with separate entrance. Otherwise, they can be treated at the end of the day to minimise contact with other COVID-19 negative patients.

RT Practice

Uninterrupted hospital service to cancer patients should be priority and to facilitate that the team of RTTs should be split into several groups depending on workload. There should not be any crossover of members from one to another. Treatment machines and simulators should be operated by minimum required number of RTTs. The teams can communicate through online digital media. RTTs involved in treatment planning should work remotely where possible.

To minimise the risk of transmission of infection in treatment console room, Perspex shields should be used while interacting with patients.

Image guided RT (IGRT) during patient setup is required for advance RT treatment modality. Daily IGRT may be avoided if possible, by adapting appropriate offline correction protocols.

In asymptomatic patients, abnormal pulmonary findings due to COVID-19 infection can be detected on RT planning or verifications images [9]. In such doubtful situation, RTTs should inform the treating physician for further investigation and necessary changes of RT treatment policies.

Strict disinfecting procedures should be adapted before and after treatment of patients with COVID-19 confirmed or suspected status. A separate team of experts should be deployed for doing the job of disinfection. Cleaning procedures should include the RT equipment, delivery room and any other equipment under suspicion of contamination.

In conclusion, RTTs have a critical role to play in the present pandemic. RTTs have to continue cancer treatment and also to support patients psychologically. COVID-19 pandemic has resulted in shrinking of workforce in hospitals. It is of utmost important that RTTs should strictly adopt hygiene protocols in the work place. Prior preparedness and adequate precaution will help RTTs to carry on the radiotherapy services uninterrupted. Principles of radiation safety viz. time, distance and shielding holds true even for protecting oneself from infection during this pandemic by following less contact time, social distancing and face/body shielding.

Acknowledgements

We would like to acknowledge to all the staff of Department of Radiation Oncology, Dr. B. Borooah Cancer Institute, Guwahati, for constant support and service during this COVID-19 pandemic.

References

References

1. [Internet]. Who.int. 2020 [cited 3 July 2020]. Available from: <https://www.who.int/docs/default-source/coronaviruse/situation->

- reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10_4*.
2. WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020 [Internet]. Who. int. 2020 [cited 1 July 2020]. Available from: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>.
 3. Yu Jing, Ouyang Wen, Chua Melvin L. K., Xie Conghua. SARS-CoV-2 Transmission in Patients With Cancer at a Tertiary Care Hospital in Wuhan, China. *JAMA Oncology*. 2020; 6(7)[DOI](#)
 4. Coronavirus Disease (COVID-19) Situation Reports [Internet]. Who.int. 2020 [cited 1 July 2020]. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>.
 5. Cancer [Internet]. Who.int. 2020 [cited 1 July 2020]. Available from: <https://www.who.int/news-room/fact-sheets/detail/cancer>.
 6. Delaney Geoff, Jacob Susannah, Featherstone Carolyn, Barton Michael. The role of radiotherapy in cancer treatment. *Cancer*. 2005; 104(6)[DOI](#)
 7. Begg Adrian C., Stewart Fiona A., Vens Conchita. Strategies to improve radiotherapy with targeted drugs. *Nature Reviews Cancer*. 2011; 11(4)[DOI](#)
 8. The Royal College of Radiologists. The timely delivery of radical radiotherapy: standards and guidelines for the management of unscheduled treatment interruptions. *Fourth edition*. London: *The Royal College of Radiologists*; 2019.
 9. Suppli Morten Hiul, Riisgaard de Blanck Steen, Elgaard Tenna, Josipovic Mirjana, Pøhl Mette. Early Appearance of Coronavirus Disease 2019 Associated Pulmonary Infiltrates During Daily Radiotherapy Imaging for Lung Cancer. *Journal of Thoracic Oncology*. 2020; 15(6)[DOI](#)