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Functioning of Radiation Therapy During COVID-19 Pandemic in Red Zone COVID Hospital

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Abstract

COVID 19 Pandemic started in December 2019, and reached India during March 2020, and caused a panic among cancer patient and oncology health workers. CDC gave few guidelines to continue Radiation Therapy. We followed these guidelines alongwith precautionary measures and treated about 50 pateints per day during Lockdown period. Extreme care and precaution helped us in treating all patients and helped all staff to protect from COVID infection and cancer patient by preventing transmission.

Keywords: Covid-19, Red Zone Hospital

Introduction

Wuhan, China, In December 2019, witnessed the outbreak of the novel corona virus which soon became an international public health emergency and world pandemic. In India, we are at a time where preparation for health care systems is critical. Rapidity with which SARS-CoV-2 is spreading, we can expect an increased burden of patients with cancer who have received a diagnosis of COVID-19 at oncology treatment clinics and a need to address this diagnosis. As of the date of this writing, India has witnessed an increase in confirmed cases, not far behind the large outbreaks of USA and European countries.

After outbreak of COVID-19 researchers all over world have published on their experience and have highlighted high-risk groups, including the elderly and patients with co morbidities, including cancer. In one of the largest series reported from Wuhan, elderly patients were at a higher risk for disease severity, with an 8.0% case fatality rate in those aged 70 to 79 years and 14.8% in those aged 80 years and older. The case fatality rate for patients with cancer in that cohort was notably higher than that among patients without cancer, at 5.6% versus 2.1% in the whole sample; however, it must be noted that this series is very small.[1] How these numbers will evolve in Indian population remains to be determined. Based on available data, the impact of patients both at risk for and positive for COVID-19 will be felt throughout oncology department.

Patients with cancer are known to be at an higher risk for community-acquired respiratory infection, such as COVID, because of their frequently observed immunocompromised state and low immunity and can also be a source of transmission to the community, if not taken care.

Mode of Transmission of COVID-19

It is well established fact that the following are the routes of transmission of COVID-19.

Person-to-person transmission: Direct person-to-person transmission is the primary means of transmission of corona virus 2 (SARS-CoV-2). It is thought to occur through close-range contact, mainly via respiratory droplets; virus released in the respiratory secretions when a person with

infection coughs, sneezes, or talks can infect another person if it makes direct contact with the mucous membranes; infection can also occur if a person touches an infected surface and then touches his or her eyes, nose, or mouth. Droplets typically do not travel more than six feet (about two meters).

Environmental contamination: Virus present on contaminated surfaces may be another source of infection if susceptible individuals touch these surfaces and then transfer infectious virus to mucous membranes in the mouth, eyes, or nose. Its likely that where there is heavy viral contamination its more potential source of infection.(e.g., in an infected individual's household or in health care settings). Extensive SARS-CoV-2 contamination of environmental surfaces in Radiation Therapy room of patients with COVID-19 was detected on nearly all surfaces tested (Door handles, floor, light switches, bed and handrails, windows, toilet bowl, sink basin, treating couch etc.)

According to Centers for Disease Control (CDC) data available on SARS-CoV-2, the virus appears to spread via respiratory droplets and contaminated surfaces and to require contact with the bodily fluids or secretions of an infected individual Fortunately, modern health care facilities are usually prepared to deal with this route of spread owing to experience with other respiratory viruses, such as influenza. However, when dealing with a new pathogen for which limited information exists, predicting the efficacy of these measures is difficult.[2] Therefore its imperative that patients with cancer be prevented from congregating in areas with potential SARS-CoV-2 carriers, which means controlling exposures in waiting rooms and treatment areas. Guidelines for prevention of other respiratory viral spread in the health care setting for patients with cancer was followed at department of Radiation Oncology. In addition to the continually updated recommendations from the CDC and World Health Organization.[3]

Materials and Methods

Precaution and Care

Between 25 th March 2020 to 15 May 2020, 1500 confirmed cases of covid 19

were admitted at our institute. Radiation oncology department at SAIMS is uniquely taxed by an extra population of patients reporting to waiting rooms for daily radiation treatments. During COVID lockdown period since 22nd March to 30 May we have treated about 50 patients daily by Radiotherapy. To counter the risk to the doctors and technician staff and also the patient and their attendant specific care has been taken by allotting time to patient, along with maintaining social distancing.

The Radiation staff was equipped with gown, N95 Mask and face Shield, for personal protection, along with prophylactic treatment with Tab HCQ 400 mg (12 hourly first day, followed by HCQ 400 once weekly).

In addition to above measures, patient were treated with Hypo fraction regimen minimizing ambulatory visits with shorter RT courses,. Hypo-fractionation using once daily RT is a form of accelerated RT with shorter courses involving moderately increased doses per fraction and delivery over 3 to 5 weeks, which is briefer in comparison with a conventional course over 6 to 7 weeks Minimizing ambulatory visits with shorter RT courses.[5] Various Hypofractionation Regimen used were:

- Ca Cervix: 45gy/20# along with ICRT Boost
- Ca Breast: 39gy/15#
- Head and Neck Ca: 45gy/20#
- 30gy/10# Palliative care.

Another consideration is that of shared treatment machines. Members of this patient group are treated on one machines shared among many patients daily. Therefore Radiation oncology department at SAIMS reviews established infection control protocols and adapt as necessary to the unique considerations of SARS-CoV-2, in accordance with CDC recommendations. Areas contaminated by a person under investigation or a patient with confirmed COVID-19 are decontaminated. As per the CDC recommendation, routine cleaning and disinfection procedures as appropriate for SARS-CoV-2 in the health care setting is done. which include disinfecting active breathing control devices, treatment couch, handles for arm positioning, and any attachments of the treatment couch that contact the patient.[6] Finally, Potentially contaminated personal protective equipment and/ or garments are discard before leaving the hospital so as not to carry viral particles outside.

Measures for all patients, visitors, and Medical Staff.

- Patients is screened for clinical manifestations consistent with COVID-19 (eg, fever, cough, myalgias, sore throat, dyspnea, anosmia/ hyposmia) prior to entry into Department of radiation Oncology at emergency/ CCU. (Fig. 1 and 2)

- Second screening is done at department of Radiation Oncology by Physician (Fig. 3)
- Social Distancing : Patient are given time at which he will be given Radiation and on arrival are queued maintaining social distancing norms, leaving a seat between two person to avoid any physical contact. (Fig. 4 and 5)
- Workplaces are cleaned and sterilized: Surfaces (e.g. desks, Chair and tables) and objects (e.g. telephones, keyboards, Moulds) wiped with disinfectant regularly before and after use (Fig. 6,7,8,9,10)
- Extra care is taken by treating Physician and Radiation technician to prevent any cross infection while examining patients, wearing N95 mask, face shields, single use gloves, gown. (Fig. 11, 12)
- In addition Patient undergoing daily Radiation were provided hostel accommodation in campus with proper sanitized food. Hostel area was regularly

Fig. 1: Screening at Emergency

Fig. 2 & 3: Screening at Entrance of Radiation oncology Department

Fig. 4: Waiting area before Radiation

Fig. 5: Waiting area at OPD

Fig. 6: Sterilizing Chair

Fig. 7: Sterlizing Mould

Fig. 8: Sterilizing Door Handle

Fig. 9: Sterilizing Mould Couch

Fig. 10: Sterilizing Treating Couch

Fig. 11: Examining Pateint in OPD with full Caution

Fig. 12: Radiation Therapy with all Precaution

Fig. 13: Team Radiation Oncology

sanitized in this Lock down period from 23 March to 30 May.

Promoting regular and thorough hand-washing by Doctors, Technician, Nurse. 5 Moments for Hand Hygiene Use alcohol-based hand rub or wash hands with soap and water:

1. Before touching a patient
2. Before engaging in clean/aseptic procedures
3. After body fluid exposure risk
4. After touching a patient
5. After touching patient surroundings

Result

We retrospectively selected 8 (0.53%) patients with cancer of 1500 patients admitted between 25 March 2020 to 15 May 2020 at our institute for quarantine Daily more then 50 patient were given Radiation and treated at Department Of Radiation Oncology at SAIMS, Indore. Physician and technician were equipped with gown, N95 Mask and face Shield, for personal protection, along with prophylactic treatment with Tab HCQ given as per guidelines and thus preventing community spread and cancer patient were helped. None of the staff working was infected, nor there was patient to patient transmission. (Fig. 13)

Conclusions

Overall, it is important to remember that radiation oncology clinics have always functioned as an interdisciplinary team of support staff, nurses, therapists, dosimetrists, physicists, and physicians, all aiming to help patients with cancer. Heading into the fight with COVID-19, Extreme care was taken to protect patients with cancer, support staff, nurses, therapists, dosimetrists, physicists, and physicians, all aiming to help patients with cancer and hence No infection and transmission was reported while Daily Radiating more then 50 patients at time of COVID Pandemic at Department of Radiation Oncology at Sri Aurbindo Institute of medical sciences, Indore.

As the World Health Organization reminds us during this time: “Be safe, be smart, be kind.”

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