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Original Article

Impact of nationwide lockdown on cancer care during COVID-19 pandemic: A retrospective analysis from western India



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ABSTRACT

Background and aims: COVID-19 has impacted healthcare system worldwide including cancer case. Aim of this study was to describe the experience of lockdown on cancer care concerning patient's visit and reception of treatment in western India.

Methods: This is a retrospective observational study conducted in patients with cancer attending a tertiary care center pre-lockdown and during lockdown (from January to May 2020). Data related to demographic parameters, type of tumor, type of treatment received and functional status of patients were retrieved from hospital medical records of patients.

Results: Of the 5258 patients included, 4363 visited hospital pre-lockdown (median age, 50 years) and 895 visited during the lockdown period (median age, 47 years). A total of 1168 and 106 patients visiting hospital before and during lockdown, respectively, had comorbidities. Breast cancer (25.6% and 29.7%), head and neck cancer (21.3% and 16.9%) were the most common type of solid tumors; leukemia (58.0% and 73.0%), lymphoma (18.8% and 13.5%) and multiple myeloma (18.6% and 12.2%) were the most common type of hematological malignancies observed in patients visiting pre-lockdown and during lockdown, respectively. Chemotherapy was most commonly received treatment (pre-lockdown, 71.8%; during lockdown, 45.9%). Other therapies reported includes supportive/palliative, targeted, hormonal, and immunotherapy. The majority of patients who visited the hospital pre-lockdown (68.4%) and during lockdown (62.8%) had 0 or 1 Eastern Cooperative Oncology Group (ECOG) score.

Conclusion: Overall observations highlight a substantial impact of an imposed nationwide lockdown during COVID-19 pandemic on cancer care of patients in terms of reduced patient visits and number of treatments received.

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1. Introduction

The coronavirus disease-2019 (COVID-19) pandemic is a swiftly developing situation, placing the unrivalled burden on the healthcare system across the world [1]. The severe acute respiratory syndrome novel coronavirus 2 (SARS-nCoV-2) infection and derived ailment, COVID-19, has led to the unpredictable mortality and morbidity across the population in India [2]. Worldwide, more than 35 million cases of COVID-19 have been confirmed including 6,549,373 cases from India as of October 5, 2020. This deadliest

pandemic is causing a profound impact on the entire oncologic community by reducing the patient's visit to hospital amid lockdown in India from March 22, 2020, further compromising the oncologic care [3]. This contagion has also hampered the effectiveness of healthcare delivery, by placing frontline healthcare workers at risk of contracting the infection [2].

Currently, there is limited literature on the evidence of increased mortality in cancer patients infected with COVID19, however, cancer patients are at increased risk of acquiring the SARS-nCoV-2 infection and its associated complications [4–7].

The most common clinical symptoms of COVID-19 infection are fever (88%), dry cough (67%), fatigue (38%), shortness of breath (19%), muscle pain (15%), sore throat (14%), and headache (14%) [8]. These symptoms are also commonly found in cancer patients, thus

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creating a difficult situation for a clinician to ascertain the COVID-19 diagnosis [9]. Solid tumors and hematological malignancies when combined, both globally rank as the second leading cause of death, estimated to 9.6 million deaths in 2018 [10]. In a developing country like India, where 1.15 million new cases are being diagnosed per year, foisting lockdown has profoundly procrastinated cancer treatment [11].

The present retrospective study aimed to describe the impact of lockdown due to unprecedented COVID-19 crisis on cancer care in terms of patient's visit, reception of treatment and number of patients visiting (both new and ongoing) at a tertiary cancer center in western India.

2. Methods

This was a retrospective observational study conducted in patients attending OPD at the Department of Medical Oncology, The Gujarat Cancer and Research Institute from January 1, 2020 to May 31, 2020, before and during the nationwide lockdown for COVID-19 pandemic. The study protocol was approved by Institutional Ethics Committee and the study was conducted in accordance with the principles of Declaration of Helsinki.

The study included patients of either sex, with any type of cancer that have visited our hospital before lockdown initiation and during nationwide lockdown. Data related to demographic parameters (age, sex, and comorbidities), type of tumor, type of treatment received and functional status of patients were retrieved retrospectively from hospital medical records of patients.

Descriptive data analysis was performed using Microsoft Excel. Quantitative variables were presented as median (range) and qualitative variables were presented as frequency (percentages).

3. Results

Out of total 5258 patients included, 4363 visited the hospital before lockdown and 895 visited during the lockdown period. The median (range) age of patients from pre-lockdown group and during lockdown group was 50.0 (13.0–96.0) years and 47.0 (2.0–80.0) years, respectively. Proportion of female patients was higher in both groups (pre-lockdown, 53.2% and during lockdown, 55.0%). Total of 1168 patients who visited hospital before lockdown had comorbidities and of these, 64.6%, 31.5%, and 3.9% of patients reported to have one, two, and three comorbidities, respectively. Out of 106 patients with comorbidities who visited hospital during lockdown, 79.2% reported to have one comorbidity, 14.1% reported two comorbidities and 6.7% had three comorbidities (Table 1).

Among patients with solid tumors who visited the hospital before and during lockdown, breast cancer (25.6% and 29.7%), head and neck cancer (21.3% and 16.9%), and gynecologic cancers (11.0% and 8.2%) were the most common type of cancers observed. Proportion of patients with other types of cancers is described in Fig. 2.

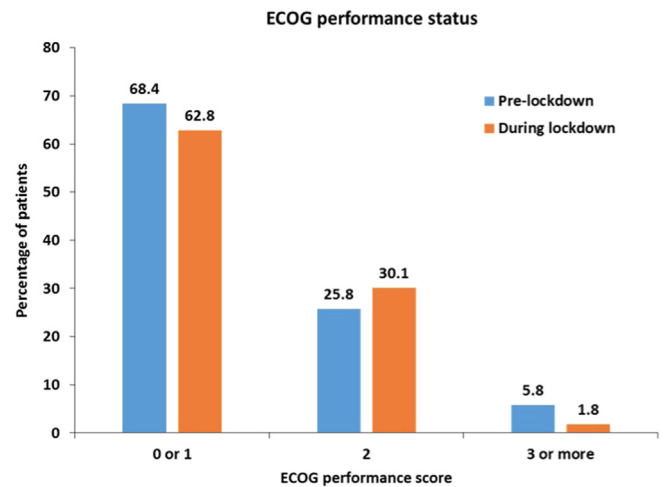


Fig. 1. Functional status assessment of the study patients. ECOG, Eastern Cooperative Oncology Group.

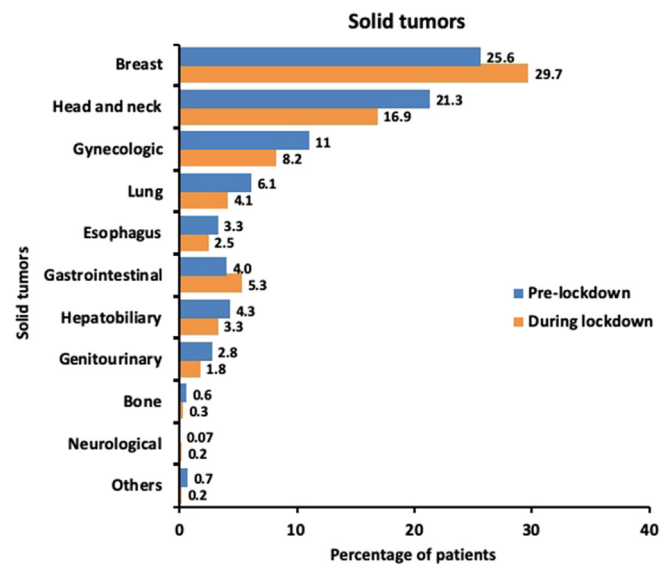


Fig. 2. Proportion of patients with solid tumors.

In patients with hematological malignancies who visited the hospital before and during lockdown, majority of patients had leukemia (n = 511, 58.0%; and n = 179, 73.0%). Among these, patients with acute lymphoblastic leukemia (6.4% and 10.6%) was the predominant type of malignancy followed by chronic myeloid leukemia (3.5% and 6.3%), acute myeloblastic leukemia (1.5% and

Table 1 Demographics.

Parameters	Pre-lockdown (N = 4363)	During lockdown (N = 895)
Age (years), median (range)	50 (13–96)	47 (2–80)
Sex		
Men	2042 (46.8)	402 (45.0)
Women	2321 (53.2)	493 (55.0)
Patients with Number of comorbidities	1168	106
1	754 (64.6)	84 (79.2)
2	368 (31.5)	15 (14.1)
3	46 (3.9)	7 (6.7)

Data shown as n (%), unless otherwise specified.

2.7%), and chronic lymphocytic leukemia (0.3%, each). Total of 165 and 33 patients with lymphoma visited the hospital pre-lockdown and during lockdown, respectively. Among these, majority of patients had non-Hodgkin lymphoma (pre-lockdown, n = 110 and during lockdown, n = 24). In total 164 and 30 patients with multiple myeloma visited the hospital before lockdown and during lockdown, respectively. Fourteen patients with myelodysplastic syndrome visited the hospital before lockdown; while only one patient with myelodysplastic syndrome visited the hospital during lockdown period (Table 2).

Before lockdown, majority of patients received chemotherapy 71.8% (intravenous, 70.0%, concurrent, 9.6% and oral, 1.8%), denosumab/bisphosphonates (6.4%), supportive/palliative therapy (5.9%), and targeted therapy (4.1%). Few other therapies that were received by patients include induction therapy (1.1%), hormonal therapy (1.0%), and immunotherapy (0.1%) (Table 3).

During lockdown, chemotherapy was the most common treatment received by patients (intravenous, 34.4%, oral, 11.5% and concurrent, 9.8%), followed by hormonal therapy (12.2%), targeted therapy (9.5%), supportive/palliative therapy (5.8%), and Denosumab/Bisphosphonates (4.0%). A very few patients visited the hospital for induction therapy (1.3%) and immunotherapy (0.3%) (Table 3).

Functional status assessment using Eastern Cooperative Oncology Group (ECOG) performance scale showed that the majority of patients who visited the hospital pre-lockdown (68.4%) and during lockdown (62.8%) had 0 or 1 score. Around one-third of patients had ECOG score of 2 (pre-lockdown, 25.8% and during lockdown, 30.1%). Remaining patients had ECOG score of 3 or more (pre-lockdown, 5.8% and during lockdown, 1.8%) (Fig. 1).

4. Discussion

The nationwide lockdown due to COVID-19 pandemic crisis has affected every sector of healthcare system including oncology care. Moreover, this pandemic and subsequent lockdown has redirected the primary focus of healthcare system to optimally manage COVID-19 patients and routine clinical services in oncology care has become secondary focus thereby curtailing the access to these clinical services. Deferral in cancer care including diagnosis and treatment can worsen the long-term survival outcomes in cancer patients.

The present retrospective study attempted to assess the impact of lockdown on several different aspects of cancer care such as change in patient load attending to tertiary care center, types of treatments received, and functional status of patients. Overall observations of this study indicate a steep decrease in numbers of patients visiting the hospital during lockdown period. There was

around 4.8-fold decrease in the proportion of patients with cancer who visited our tertiary care center during this two and half months' lockdown period. The possible reasons for this reduction in patients load can be multiple. Firstly, patients are scared of contracting COVID-19 infection while visiting hospitals or during travelling. Second major reason is suspended transport services during lockdown that could have obstructed patients to reach hospitals for their scheduled chemotherapy or surgery or follow-up visits [12,13]. In India, many patients live in rural areas or small cities. The prevalence of cancer in rural areas and urban areas of India is 71 and 110 per 100,000 persons, respectively. Similarly, estimated prevalence of cancer among illiterates and literates is 79 and 173 per 100,000 persons [14]. As majority of cancer care centers are in metro cities, these patients found it difficult to travel to cancer care centers. Thirdly, shutting down of cancer care facilities due to COVID-19 spread in the healthcare staff is another limitation that may hamper patient's access to the cancer care center. Lockdown have also affected other aspects of patient care such as unavailability of essential medicines in nearby pharmacies or travel bans due to strict government rules during lockdown may pose the risk of interruptions in drug supply chains and drug shortages in small towns or rural areas. Another important challenge during lockdown is to deliver optimal cancer care in resource limited settings and oncology community has a greater responsibility on their shoulders to provide best possible treatment to each patient in this horrendous pandemic.

Overall, there is a significant change observed in the approach to cancer care from the side of patient's as well as healthcare staff's during this lockdown. A viewpoint on treatment delays in oncology patients during COVID-19 pandemic highlighted several factors that might delay treatment. These include patient-related factors (travel inconvenience due to lockdown, financial issues, patients coming from distant places for treatment, and accommodation and food-related issues) and healthcare-related factors (delays in surgery, shortage of personal protective equipment and ventilators, and manpower shortage). In addition, authors also described delay in treatment-naive patients can adversely affects survival and quality of life and will have psychological stress due to fear of disease progression or recurrence [15].

The present study did not report any major change in the proportion of patients attending our tertiary care center according to malignancy type. In both periods, before and during lockdown, the most common solid tumors were breast cancers and head and neck cancer, gynecologic cancers, and lung cancers. Leukemia, non-Hodgkin lymphoma and multiple myeloma were the most common type of hematological malignancies observed in patients attending our tertiary care center pre-lockdown and during lockdown.

Table 2
Distribution of patients according to malignancy type.

Parameters	Pre-lockdown (N = 4363)	During lockdown (N = 895)
Hematological malignancies	n = 881	n = 245
Leukemia		
Acute lymphoblastic leukemia	280 (6.4)	95 (10.6)
Acute myeloblastic leukemia	66 (1.5)	25 (2.7)
Chronic myeloid leukemia	152 (3.5)	56 (6.3)
Chronic lymphocytic leukemia	13 (0.3)	3 (0.3)
Lymphoma		
Non-Hodgkin lymphoma	110 (2.5)	24 (2.7)
Hodgkin lymphoma	55 (1.3)	9 (1.0)
Multiple myeloma	164 (3.8)	30 (3.3)
Myelodysplastic syndrome	14 (0.3)	1 (0.1)
Others	27 (0.6)	2 (0.2)

Data shown as n (%).

Table 3
Types of treatment received across the study population.

Parameters	Pre-lockdown (N = 4363)	During lockdown (N = 895)
Chemotherapy		
Intravenous	3051 (70.0)	308 (34.4)
Oral	79 (1.8)	102 (11.4)
Concurrent chemotherapy	417 (9.6)	88 (9.8)
Targeted therapy	180 (4.1)	85 (9.5)
Immunotherapy	6 (0.1)	3 (0.3)
Induction therapy	46 (1.1)	12 (1.3)
Hormonal therapy	45 (1.0)	109 (12.2)
Denosumab/Bisphosphonates	278 (6.4)	36 (4.0)
Supportive/Palliative therapy	261 (5.9)	52 (5.8)

Data shown as n (%).

In treatment reception, chemotherapy was most commonly received treatment in the present study population; however, the number of chemotherapies received during lockdown were certainly less compared to those received before lockdown. This can be attributable to the multiple reasons including change in the perspective of oncologist regarding chemotherapy schedules, deferral of chemotherapies for a period where outcomes would not be substantially affected by postponement, and difficulty in access to chemotherapy centers due to suspended modes of travel during lockdown. However, the number of hormonal therapies and targeted therapies received during lockdown were comparatively higher than before lockdown indicating preference of oncologists for these types of therapies during lockdown and COVID-19 pandemic. This is also convenient to the patients with reduced follow-up. A survey of oncologist assessed how rapidly the oncology hospitals adapted to the COVID-19 pandemic and other clinical services including surgery for cancer and preparedness of the hospitals across the various cities and importantly COVID-19 zones from India. This survey reported impact of pandemic on routine outpatient services such as suspension of cancer screening by almost 50% of oncologist from tier-1 cities and red zones; continued cancer surveillance by majority of oncologists (80.0%). Dedicated cancer institutes continued chemotherapies and supportive care in all oncological subspecialties compared to multi-specialty hospitals ($P < 0.05$). In addition, telemedicine options were used in around 72% of follow-up consultations by many hospitals to provide uninterrupted cancer care, especially for oncologic surveillance. Among these hospitals, majority of private hospitals and hospitals in tier-1 cities used telemedicine for cancer surveillance and patient care compared to tier-2 and tier-3 cities. The less use of telemedicine in these cities can be attributed to the limited ability of patients to use digital health services due to poverty and illiteracy [14]. Use of telemedicine consultations in various stages of cancer care is strongly recommended across the various international and national guidelines [16–18]. Delivering chemotherapy at home is another option is medically and logistically feasible for few patients [17,19]. Patients in advanced stages of cancer with terminal condition can be advised to take palliative care at home to avoid risk of COVID-19 infection [20,21].

In the present study population, majority of patients were functionally active with restricted physically strenuous activity in both groups. A small fraction of population (1.8%) who visited our tertiary care during lockdown reported ECOG score of 3 or more indicated worsened disease progression and functional activity. As majority of patients had mild to moderate disease progression, the advanced treatment or hospitalization was not required for these patients and it could have been possible to delay their treatment or replace originally decided treatment with oral drug therapy without impacting their prognosis and outcomes.

5. Conclusion

A sharp decrease of number of patients and a noticeable change in the treatment's reception (lower number of chemotherapies and higher number of hormonal oral chemotherapy and targeted therapies) during lockdown period highlights a substantial impact of nationwide lockdown during COVID-19 pandemic on care of patients with cancer.

Author contributions

Conceptualization: AP, AAP; Data curation: AP, AAP, HA, PGK, SP, AD, SS, NA, DM, RGR, YG, HPP, and Sonia Parikh; Formal analysis: AP, AAP; Investigation: AP, AAP, HA, PGK, SP, AD, SS, NA, DM, RGR, YG, HPP, and Sonia Parikh; Methodology: AP, AAP; Project administration: AP, AAP; Supervision: AAP; Roles/Writing (original draft): AP; Writing (review and editing): AAP, HA, PGK, SP, AD, SS, NA, DM, RGR, YG, HPP, and Sonia Parikh. All authors reviewed and approved the final version for submission.

Declaration of competing interest

None.

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