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Outcome of Breast Cancer Patients with COVID-19 Infection: A Report from a Tertiary Cancer Center in India

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ABSTRACT

Introduction: There is no data on the outcome of COVID-19 infection in patients with breast cancer from India. This study was done to assess the outcome of patients with breast cancer who had COVID-19 infection.

Methods: We analyzed patients with breast cancer who were diagnosed with COVID-19 infection from May to September 2020 in the medical oncology department of a tertiary cancer center in India. Symptomatic patients (fever and influenza-like illness symptoms) or asymptomatic patients planned for systemic therapy were tested for COVID-19 by RT-PCR.

Results: A total of 441 breast cancer patients received 1174 systemic therapies from May to September 2020. Among them, 36 patients who had COVID-19 infection were analyzed in detail. The majority (86%) were asymptomatic at presentation. The most common symptoms were fever followed by cough. Patients were either admitted to the hospital (53%) or kept in home quarantine (47%). Patients who received oxygen, non-invasive assisted ventilation (NIV), and mechanical ventilation (MV) were 8%, 3%, and 3%, respectively. The median duration of hospitalization and home quarantine was 11 days and 19 days, respectively. The recovery of patients with COVID-19 infection was 94%. The median duration to clearing SARS-COV-2 by RT-PCR was 19 days. The total/all-cause mortality was 6% (n=2). The mortality due to COVID-19 infection was 3% (n=1). Subsequently, 89% were restarted on systemic therapy. The median delay in restarting systemic therapy was 23 days.

Conclusion: Systemic therapy can be safely administered during the ongoing COVID-19 pandemic.

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INTRODUCTION

As per GLOBOCAN 2020, breast cancer is the most common cancer in Indian women (26.3%) with an age-standardized incidence rate of 25.8%.[1] India has the 2nd largest number of COVID-19 confirmed patients in the world next to the United States and

currently is in the second wave of the pandemic. Although India ranks 3rd in the highest number of deaths due to COVID-19 infection, the number of deaths per million population is low (243).[2]

COVID-19 pandemic has significantly disrupted breast cancer management right from screening, diagnosis, and treatment.[3-5] The long-term impact of COVID-19 infection in patients with breast cancer is unknown. Currently, there is no report on the outcome of breast cancer patients with COVID infection from India. This study was done to assess the demographics and the outcome of breast cancer patients who had COVID infection.

METHODS

We included patients with breast cancer (age >18 years) who were diagnosed with COVID-19 infection from May to September 2020 who presented to the medical oncology department of a tertiary cancer center in India. COVID-19 testing was performed by RT-PCR at the Indian Council of Medical Research (ICMR) approved diagnostic laboratories. COVID-19 testing was performed for symptomatic patients [fever and ILI (influenza-like illness) symptoms] or asymptomatic patients who were planned for injectable systemic therapy. Besides, the test was repeated every 3 weeks for patients receiving injectable systemic therapy (chemotherapy or targeted therapy). In addition to information from medical records, patients were also contacted by telephone for the acquisition of all data.

The patients were classified into 3 age groups that included 18 to 40 years, 41 to 60 years, and above 60 years. Patients diagnosed with COVID-19 were deferred systemic therapy and referred to a government-designated COVID-19 center for further management. Patients were restarted on systemic therapy if they were asymptomatic and further COVID-19 tests were negative after 2 to 3 weeks. This study was approved by the Institutional Ethical Committee (IEC/2021/April 03).

RESULTS

A total of 441 breast cancer patients received 1174 systemic therapies from May to September 2020. Among them, 36 patients who had COVID-19 infection were analyzed in detail. The most common systemic therapy was dose dense Adriamycin cyclophosphamide/paclitaxel chemotherapy. All the patients were women, and the largest age group was 41 to 60 years (66%). The most common comorbid illness was diabetes mellitus (33%) followed by systemic hypertension (31%). None of the patients had a history of smoking. The most common stage was III (42%) followed by IV (33%). The majority of the patients (94%) were on systemic therapy at the time of COVID-19 positivity.

The most common symptoms were fever followed by cough. Among the 5 symptomatic patients, 2 had lung involvement (Table 1).

Patients were either admitted for observation or treatment in government-designated COVID hospitals (53%) or kept in home quarantine (47%). Patients who received oxygen, non-invasive assisted ventilation (NIV), and mechanical ventilation (MV) were 8%, 3%, and 3%, respectively. The median duration of hospitalization and home quarantine was 11 days and 19 days, respectively (Table 2).

Table 1. Baseline characteristics of breast cancer patients with COVID-19 infection (N=36).

Variable	N(%)
Age (years)	
18-40	6 (17)
41-60	24 (66)
> 60	6 (17)
Comorbid illness	
Diabetes mellitus	12 (33)
Systemic hypertension	11 (31)
Hypothyroidism	5 (14)
Coronary artery disease	3 (8)
Bronchial asthma	2 (5)
Psychiatric illness	2 (5)
Place	
Urban	22 (64)
Rural	13 (36)

Variable	N(%)
Stage	
Stage I	0
Stage II	9 (25)
Stage III	15 (42)
Stage IV	12 (33)
Treatment	
Dose dense Adiamycin Cyclophosphamide/ Paclitaxel (Curative)	22 (61)
Paclitaxel (Palliative)	6 (17)
Docetaxel cyclophosphamide	4 (11)
Trastuzumab based therapy	2 (5)
Zoledronic acid letrozole	1 (3)
Not yet started on treatment	1 (3)
At presentation	
Asymptomatic	31 (86)
Symptomatic	5 (14)
Symptoms/signs at presentation	
Fever	4 (80)
Cough	2 (40)
Shortness of breath	0
Pulmonary involvement[a]	2 (40)
Gastrointestinal involvement	1 (20)

[a] Details available only for patients who had imaging of chest (chest X-ray or computed tomography of chest available).

Table 2. Treatment for COVID-19 infection.

Variable	N(%)
Place	
Hospitalised	19 (53)
Home quarantined	17 (47)
Median duration	
Hospitalisation	11 days (range: 3 to 17 days)
Home quarantine	19 days (range: 7 to 28 days)
Oxygen support	
Yes	3 (8)
No	33 (92)
Non-invasive ventilation	
Yes	1 (3)
No	35 (97)
Mechanical ventilation	
Yes	1 (3)
No	35 (97)

The recovery of patients with COVID-19 infection was 94%. The median duration to clearing SARS-COV-2 by RT-PCR was 19 days and mortality was 6% (n=2). The all-cause mortality due to COVID-19 infection was 3% (n=1). Subsequently, 89% of the patients were restarted on systemic therapy. The median delay in restarting systemic therapy was 23 days (range: 0 to 150 days). None of the patients progressed due to a delay in restarting systemic therapy. The details of the patients who died are mentioned below (Table 3).

Patient 1: A 43-year-old female with hypertension and hypothyroidism was diagnosed with stage IV breast carcinoma. She had fever at presentation and tested positive for COVID-19. She was referred and admitted to a government designated COVID hospital. Subsequently, she developed cough and shortness of breath for which she was initially treated

with oxygen and NIV followed by MV. The patient died 13 days later. She had not received further systemic therapy.

Patient 2: The second patient was a 51-year-old female with diabetes, hypertension, and HbsAg positivity, with metastatic breast cancer, and prior treatment with anthracyclines, taxanes, and trastuzumab. After 1 year of disease-free survival, she had bone metastasis and was treated with and palliative radiation to the spine followed by gemcitabine carboplatin chemotherapy and zoledronic acid. After 6 cycles, she presented with progressive pleural effusion. Incidentally, she was found to be COVID-19 positive and was hospitalized for 1 week and treated symptomatically and later discharged and became COVID-19 negative. However, the patient had recurrent pleural effusion after 1 month and died due to progressive disease.

Table 3. Outcome and further treatment of Covid-19 positive breast cancer patients.

Variable	N (%)
Recovered	34 (94)
Died[a]	2 (6)
Died due to COVID-19 infection	1 (3)
Median time to COVID-19 negativity	19 days (range: 1 to 54 days)
Restarted on systemic therapy	
Yes	32 (89)
No[b]	4 (11)
Median delay in restarting systemic therapy	23 days (range: 0 to 150 days)

[a] One patient died due to progressive disease
[b] Two patients died, and two patients defaulted further treatment

DISCUSSION

This is the first report from India on the outcome of breast cancer patients with COVID-19 infection. The recovery rate was high (94%) and most patients (89%) were restarted on systemic therapy with a median delay of 23 days. The one patient who died of COVID-19 infection had metastatic breast cancer with a comorbid illness of hypertension and hypothyroidism and was symptomatic with fever and breathlessness.

Prior reports of COVID-19 infection in cancer patients have shown that advanced age, smoking, multiple comorbid illnesses, and those receiving chemotherapy have a higher risk of morbidity and mortality.[6-9] Breast cancer patients with dyslipidemia can have increased susceptibility and severity of COVID-19 infection.[10] It was hypothesized that COVID-19 infection in breast cancer patients could cause resistance to chemotherapy and tamoxifen could increase susceptibility to COVID-19 infection.[11]
COVID-19 infection-related anxiety and fear could lead to refusal of procedure/surgery in patients with breast cancer or those who are under evaluation of breast lump.[12] Suspension of screening for breast cancer due to the COVID-19 pandemic has led to breast cancer increase.[13] There was a larger decline in screening in women from underserved racial/ethnic groups and lower socioeconomic status.[14] A survey from Europe reported that significant modification of breast cancer treatment occurred during this pandemic.[15] COVID-19 vaccination can cause axillary lymphadenitis and false-positive uptake in PET (positron emission tomography) uptake.[16]

COVID-19 and cancer consortium registry study analyzed 846 patients with breast cancer and COVID-19 infection and reported that 48% were hospitalized and 9% died. Patients with older age, poor performance status, increased comorbidity burden, and presence of progressive cancer were associated with increased 30-day mortality risk.[17] A systemic review showed that the case fatality rate of patients with breast cancer (n=1296, 14.2%) was lower compared to patients with lung cancer (n=1135, 32.4%) with COVID infection.[18]

A report from France analyzed 59 breast cancer patients with COVID infection from March to April 2020 and found a mortality of 7% (n=4). All the patients who died had a significant non-cancer comorbid illness. Univariate analysis showed that hypertension and age >70 years were associated with a high risk of intensive care unit admission and death.[19]

A report from Wuhan, China compared 3 groups of COVID-19 infected patients [breast cancer (n=35); non-breast cancer (n=81); and non-cancer (n=55). This study showed that there was no difference in disease severity and outcome between non-cancer COVID-positive patients and breast cancer patients with COVID infection. Also, as compared to other cancer patients with COVID infection, breast cancer patients with COVID-19 infections were mild and predominantly asymptomatic.[20]

A prior report from Cancer Institute (WIA), Chennai showed that the incidence of COVID positivity in asymptomatic patients who were planned

for daycare systemic therapy was low (1.45%). Also, 45% were COVID-19 positive on repeat testing before subsequent cycles of systemic therapy.[21] This pandemic has led to many operational changes in National Clinical Trials Network Breast Cancer Trials like electronic consent for enrolment, telemedicine visits, and mail order pharmacy.[4] Breast cancer survivors with high spiritual well-being and psychological resilience are less likely to experience the fear of recurrence.[22]

The strength of the present study is that it is the first study reporting the outcome of breast cancer patients with COVID-19 infection in India. The limitations of the study are that it is a single-center study with a small sample size and it lacks complete information on treatment for COVID-19 infection as the patients were treated elsewhere in a government-designated COVID-19 hospital. Despite not managing the COVID-19 patients in-house, all the patients returned to our institute for further cancer treatment. Thus, we could effectively determine the COVID-19 outcomes in our patient cohort.

CONCLUSION

Despite the small sample size of this study, our results showed that the mortality rate of breast cancer patients with COVID-19 is not much different from that of the normal population. According to our results, systemic therapy of breast cancer patients can be safely administered during the COVID-19 pandemic. Further follow-up of patients is warranted to assess the long-term impact of COVID-19 infection.

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CONFLICT OF INTEREST

None.

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