International Journal of Community Medicine and Public Health
Shanmugam S et al. Int J Community Med Public Health. 2023 Jan;10(1):182-187
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20223541

Original Research Article

Impact of COVID-19 on care of cancer patients in department of surgical oncology under the Government of Tamil Nadu: a multicentre study

Subbiah Shanmugam[1]*, Dakshinamurthy Suresh Kumar[2], Ramesh Muthuvel[3], Sakthi Usha Devi Jeevarajan[4], Prinith Siga Fells[5], Sandhya Pandeshwara Ananthakrishna[1]

[1]Department of Surgical Oncology, Government Royapettah Hospital, Kilpauk Medical College, Chennai, Tamil Nadu, India
[2]Department of Surgical Oncology, Tamil Nadu Government Multisuper Specialty Hospital, Omandurar, Chennai, Tamil Nadu, India
[3]Department of Surgical Oncology, Madurai Medical College, Madurai, Tamil Nadu, India
[4]Department of Surgical Oncology, Regional Cancer Centre, Kanchipuram, Tamil Nadu, India
[5]Department of Surgical Oncology, Government Medical College, Kanyakumari, Tamil Nadu, India

Received: 04 September 2022
Revised: 31 November 2022
Accepted: 01 December 2022

***Correspondence:**
Subbiah Shanmugam,
E-mail: subbiahshanmugam67@gmail.com

ABSTRACT

Background: The novel corona virus has spread across world and has affected more than 200 countries and territories. The WHO declared this as 'Public Health Emergency of International Concern' on January 30, 2020 and since then countries all around the world are struggling to prevent their health system from collapsing due to the heavy burden of the disease. Our study was an attempt at capturing the impact of the pandemic on care for cancer patients in surgical oncology departments of different government institutions in the state of Tamil Nadu, India.
Methods: Total of 5 institutes participated in this study and the hospital records of the department of surgical oncology of institutions were evaluated from January 2019 to May 2021. The available data from prepandemic year was collected and compared to that of pandemic year.
Results: There was a fall of 18.1% and 18.8% in the out-patient and inpatient census, 52.09% and 28.5% in laparoscopic and open surgeries during first wave. The infection rate among patients was 0.99% (42 patients) and 3.86% (58 patients) in first and second wave & that among health workers was 15.7% and 15.3%. 88.6% of doctors and 25.3% of other health care workers were vaccinated.
Conclusions: The fear of pandemic along with the measures to contain the same have disrupted care for cancer patients posing risk of disease progression and upstaging. Infection rate is high among health care personnel and vaccination coverage is suboptimal**.**

Keywords: COVID-19, Cancer care, COVID in cancer surgery, Corona virus

INTRODUCTION

The novel corona virus has spread across the world and has affected more than 200 countries and territories. The current cumulative case number has crossed 244 million, while the death toll has passed 4 million as of October 2021.[1] The WHO declared this as 'public health emergency of International concern' on January 30, 2020 and since then countries all around the world are

struggling to prevent their health system from collapsing due to the heavy burden of the disease.[2]

The health system is on immense pressure and it is reflected on the services provided for noncommunicable diseases particularly for cancer patients. The 'pandemic fear' and the rising cases of COVID 19 along with the measures to contain the rise have made the cancer care a difficult task amidst the disrupted transportation across the country. Various institutions in many countries have come up with institutional protocols for the management of pandemic. As new evidences come up and shed light on the dynamics of pandemic, these protocols are frequently revisited and improved.[3-5]

Current study was an attempt at capturing the impact of the pandemic on the care for cancer patients in surgical oncology departments of different government institutions in the state of Tamil Nadu, in India.

Aims and objectives

Aim and objectives of current study: were assessment of impact of COVID-19 on care of cancer patients in terms of number of patients attending out-patient department and number of surgical procedures under taken in department of surgical oncology in different government institutions of state of Tamil Nadu and to determine the pattern of infection among the health care workers and patients.

METHODS

A total of 5 institutes participated in this study and the hospital records of the department of surgical oncology of these institutions were evaluated from January 2019 to May 2021 and the available data from pre pandemic year was collected and compared to that of pandemic year. The data related to COVID-19 infection among health care workers and the patients were also collected and analyzed. The data of first wave and second wave were collected and analyzed separately.

Study design, place and selection criteria

Current study is an observational study conducted at 5 different institutes with surgical oncology departments in Tamilnadu (Multicentre study). All the OP and IP patients of surgical oncology departments in 5 participating institutes. The infection rates in both the waves were calculated among IP patients only.

RESULTS

A total of 35674 patients turned up in out-patient department of surgical oncology in the participating institutes in Tamilnadu during the first wave of the pandemic from December 2019 to January 2021. Among these 13799 were males, 21810 were females and 65 patients were of pediatric age group. There was a fall of 18.1% in the out-patient census when compared to the year of 2019. A total of 2206 patients underwent major onco-surgical procedures during the first wave, among which 179 procedures were carried out by laparoscopy and 2027 procedures were open. There was a 52.09% fall in the number of laparoscopic surgeries while that of open was around 28.5% (Figure 1).

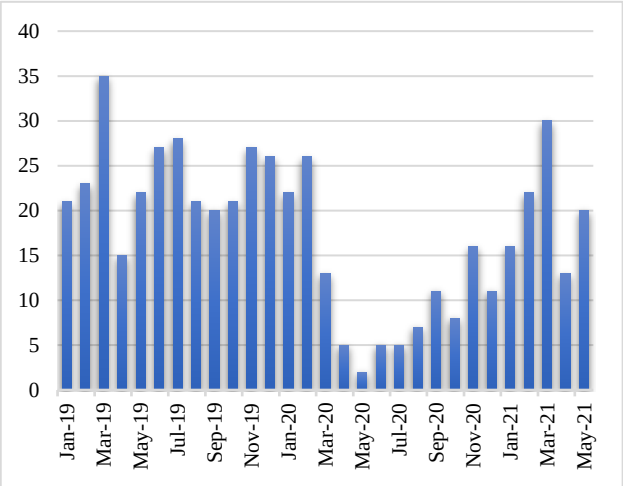

Figure 1: Laparoscopic surgeries.

A total of 4275 patients were admitted in the ward for work up and surgery and the in-patient census fell by 18.8% in comparison to prepandemic year. Among these patients 45 patients (0.99%) found to be infected by covid 19 and only one of them being a post-operative patient. All of the infected patients were RT-PCR positive and recovered completely (Table 1).

Table 1: Data on 1st and 2nd wave.

Data	1st wave	2nd wave
OP	35674	12935
OT	2206	879
Lap	179	85
Open	2027	794
IP	4275	1501
Infected	45	58
Preop	44	52
Postop	1	6

Total 191 health care workers of participating institutes worked in department of surgical oncology during the first wave and 30 (15.7%) of them were infected. Among these 46 were doctors (13 infected, 43.3%), 70 were nursing staff (9 infected, 30%) and 75 (8 infected, 26.6%) were other health care workers like OT technicians, ward boys, stretcher bearers etc. All infections were mild except for 3 (2 doctors and 1 nursing staff) who had developed moderate infection and recovered completely without any sequelae. All the infections among the health care workers were probably hospital acquired as there was no history of outside contact except for two whose spouses were positive for COVID-19. Two of the

institutions faced scarcity of health care workers, especially nursing staff, owing to covid duty and absenteeism due to infection & quarantine. There were no deaths recorded, neither among the patients nor among the health care workers (Table 2).

Table 2: Infection rate among health care providers.

Infection among health care workers	1st wave (n=191)	2nd wave (n=195)
Doctors	13	6
Nursing staff	9	15
Other health care workers	8	5

During the second wave of pandemic, from February 2021 to the May 2021, a total of 12935 patients were examined in out-patient department (8552 females, 4367 males and 16 children). 879 major onco-surgical procedure were done during this period, among which 85 were laparoscopic procedures (Figure 2).

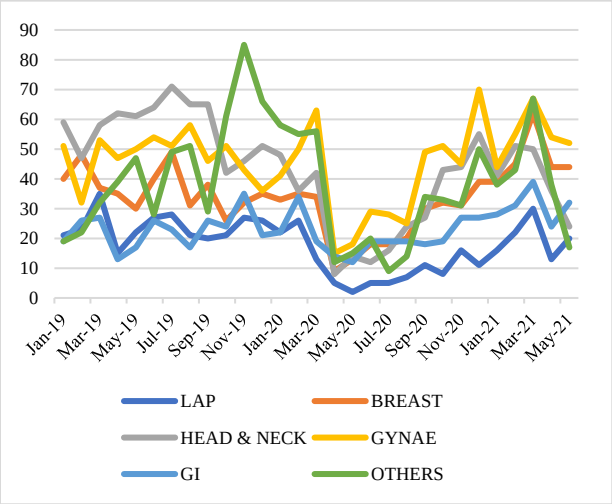

Figure 2: System-wise breakdown.

The in-patient census was 1501 during these 4 months and 3.86% (58 patients) were infected with COVID-19. Among these 6 were infected during the postoperative period and one of them died of postoperative complications exacerbated by COVID-19 pneumonia. 3 patients were diagnosed only with CT as the RT-PCR was negative for these patients (Figure 3). A total of 195 health care workers worked in department of surgical oncology in participating institutes and 30 were infected (15.3%). 53.3% were vaccinated and vaccination rates were highest among doctors 88.6% and lowest in other health care workers (25.3%). Infection rate among doctors was 18.8% (10 out of 53) and that of nursing staff and other health care workers were 22.3% (15 out of 67) and 6.6% (5 out of 75) respectively. Only one institute had provided data on antibody titers and 100% had attained protective antibody levels though one of them was later infected, the course was uneventful with mild symptoms (Table 3).

Table 3: Data on vaccination of health care workers.

HCW	Total	Vaccinated
Doctors	53	47
Nursing staff	67	38
Others	75	19
Total	195	104

One of the institutes reported that on an average 30% patients were upstaged owing to the delay due to pandemic status (infection, travel restrictions). Change in the treatment decision was observed in all institutes, for instance primary RT or induction chemotherapy for head and neck malignancies, completion of 6 cycles of chemotherapy for carcinoma ovary, avoidance of laparoscopic procedures. As expected, all institutes followed their own institutional protocols for outpatient, inpatient and OT services and for preoperative covid screening. All five institutes conducted RT PCR and CT chest for covid 19 before posting a patient for major operative procedure except for one institute which screened the patients with RT PCR alone and reserved the CT chest for oral cavity cases only.

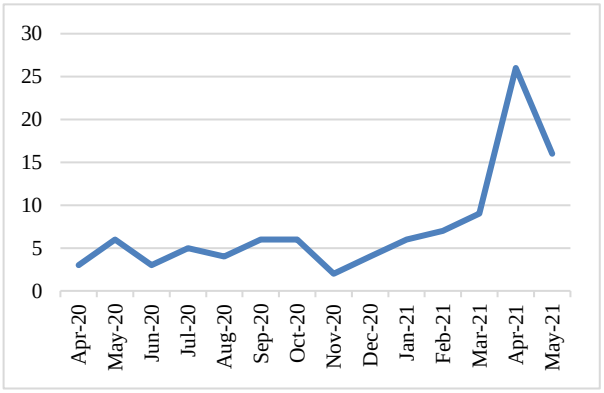

Figure 3: COVID graph.

Out of five participating institutes, two reported no change in the waiting period from diagnosis to surgery, two reported decreases in the same owing to low number of cases posted for surgery while one institute experienced an increase in the period due to time required for covid screening. All institutes worked up their patients in op basis and admitted the patients later. One institute practiced a 7day isolation period before posting the patients for a major operative procedure. Average length of hospital stay was same in three institutes, one reported a longer stay owing- to 7 days isolation before surgery while another reported a shorter stay as they followed an early discharge protocol. In OTs fresh filters were used for each case in 3 institutes, while they were daily changed in other two and weekly or bi-weekly fumigation was practiced in all five institutes.

DISCUSSION

The COVID 19 has emerged as a global crisis leaving the world to deal with unforeseen challenges in every aspect from health care system to global economy. The pandemic has affected the health care system in many dimensions. It has impeded the delivery of the resources, overwhelmed the facilities and increased the utilization of telemedicine. Adapting to the growing needs, the health care systems across the world have responded by reducing the outpatient visits of patients with chronic non-communicable diseases, postponing elective surgeries, early discharge of the operated patients and by diverting the resources for emergency services and COVID care.

COVID-19 has proven itself to be an opportunistic disease, taking advantage of a patient with a weakened immune system. A cancer patient, under treatment or not, is likely to have a damaged immune system due to the characteristics of the disease and supposed to be more susceptible to the infection and its complications.[6] Patients undergoing systemic treatment (chemotherapy or immunotherapy) or surgery are at greater risk for the development of serious COVID-19 events, and that this risk increased even more in older patients, compared with patients without cancer, making the care for these patients even more difficult.[7] NCCN recognizes this growing threat and recommends to prioritize patients with active cancer and those on treatment for vaccination when any vaccine that has been authorized for use by the FDA is available to them. For major surgical procedures the NCCN advises treating clinician to separate the date of surgery by from vaccination by few days so that the symptoms can correctly be attributed to surgery or vaccination.[8] Updated COVID 19 guidelines have been published by Indian Association of Surgical Oncology (IASO) on April 16th 2020, advising to choose the treatment with the intent of better survival and optimal minimal therapy possible as per the stage of the disease and clinical condition. It includes system-wise guidelines for most of the cancers with specific recommendations.[9]

The Global data shows that during the COVID-19 pandemic, there has been a reduction in the number of patients accessing cancer services across countries, irrespective of income status. An ambidirectional cohort study at 41 cancer centres across India under National Cancer Grid of India showed a significant reduction in new patient registration, follow up visits, admissions, major and minor surgeries, chemotherapy and radiotherapy registrations.[10] The COVID surg collaborative estimated that across the world, 37% of cancer surgeries were cancelled during the peak 12 weeks of the COVID-19 pandemic.[11] In accordance with national and the international data we experienced a 18.1% fall in the outpatient census, 14.1% fall in admissions and 31.5% reduction in major operative procedures in 2020 during the first wave of pandemic. The fall in the laparoscopic surgeries was more substantial in comparison to open procedures. This fall could be explained by the fear among the surgeons about theoretical risk of spread of COVID-19 while using energy devices and evacuation of pneumoperitoneum even though the concrete proof of the same is yet to be found.[12] We found that 0.9% of our inpatients were infected with COVID-19 during the first wave and the number raised to 3.86% during the second wave. Jing Yu et al reported a infection rate of 0.79% among cancer patients admitted in one of tertiary health care centers in Wuhan, China, during the initial months of first wave which was more than two times the cumulative infection rate in the city at that time.[13] A similar substantial raise in infectivity during second wave was reported by Julia M. Berger et al in a large tertiary care center in Austria in where 1.5% patients tested positive during second wave in comparison to 0.5% in first wave.[14] This is could be explained by the fact that during the second wave the daily case load of COVID 19 increased by almost three times that of first wave owing to the highly infectious nature of mutant variant of SARS-CoV-2 (B.1.617 lineage), to the complacent behavior of the population, and to the relaxation of interventions.[15] While health workers represent less than 3% of the population in the large majority of countries and less than 2% in almost all low- and middle-income countries, around 14% of COVID-19 cases reported to WHO are among health workers.[16] In our study we report 15.9% prevalence of infection among health care workers during the first wave and they comprised 41.6% of all infected. While the prevalence remained almost same during the second wave i.e.,15.3%, the health care workers accounted for 34.09% of all infected in the institutes during the second wave. Though an increased rate of infection is expected among the health care workers, it raises a serious concern of hospital-based clusters. In our study we found that though the vaccination rates among doctors are 88.8% that of nursing staff and other health care workers are not satisfactory at 56.7% and 25.3%. An article published in a weekly journal by CDC reported a highest vaccination coverage among physicians and advanced practice providers (75.1%) and lowest among nurses (56.7%) and aides (45.6%) voicing a concern on disparity of the coverage.[17] This is surely of significant concern considering the nursing staff and aides spend a considerable amount of time with the patients while providing routine care. 11 health workers among the vaccinated were later infected, showed mild symptoms and recovered without any complications. We observed an increase in upstaging of the disease leading to change in treatment plans, delays and interruptions in chemotherapy cycles due to covid infection and issues with transport system. Firat et al compared the stage distribution of head neck cancers in 2020 to that of corresponding months of prepandemic year. He observed a significant increase in T3/4 cases in larynx, upstaging of N stage in oral cavity cancers and increased need for pedicled or free flap reconstruction in 2020.[18] A similar study conducted by Jalaeefar et al and his team on gastric cancer patients showed an increase in the nodal stage,

peritoneal involvement and positive peritoneal cytology in the 2020 when compared to corresponding months of 2019.[19]

Treatment decisions were changed many a times preferring nonsurgical approach whenever possible, induction chemotherapy or definitive radiotherapy for head and neck cancers, completion of neo-adjuvant chemotherapy for breast and ovarian cancers. This is accordance with guidelines published by Indian association of surgical oncology (IASO) on April 16th 2020 which advised to provide the patients with optimal minimal therapy possible and to avoid surgery with doubtful benefits and for poor prognostic diseases.[9] All 5 five institutes used their own institutional protocol re-organizing the health care system to deal with crisis while providing optimal care for patients like many other cancer centers across the world.[20] One of the institutes has published an article on the strategies implemented during initial phase of first wave of pandemic and its experience during the said time.[3] The institutes maintained the social distancing and hand hygiene during the patient care in OP and IP set ups. Beds were set up with a minimum of 1m distance in between and not more than one attender was allowed with all admitted patients. All patients both OP and IP were screened for fever and detailed history of COVID 19 like symptoms were taken. RT PCR was done at the admission time for all patients planned for surgery. CT chest was done for all patients posted for major surgical procedures in all institute except one where it was done for only oral cavity cases. In one institute patients were admitted to an isolation ward after a negative RT PCR test and observed for 7 days before shifting to preoperative ward. CT chest was done within 72 hrs of surgery.

The COVID-19 has had an immense impact on the health economy across the world. The health system is struggling to maintain non-COVID care as the necessities have raised due to pandemic status in the country. In our study we observed additional cost was incurred by the hospitals for the COVID specific requirements. In operation theatres fresh filters were used for each case in 3 institutes while in other 2 they were changed daily. Weekly or bi-weekly fumigation and daily carbolisation was practiced in all institutes., PPE kits were used only for proven positive cases except in 2 institutes where they were used for all major cases. Increase in the requirements of filters, face masks, PPE kits, cleaning supplies, sanitizers and cost for RT PCR are all the extra expenses bore by the government for treating non-COVID cases in this era of pandemic. The patients themselves had to spend unreasonable amount of money on transport due to restriction on public transport and for food during lockdown. The cost of CT chest which was mandatory before the surgery and for admission in few institutes was also bore by the patients themselves. With the fear of another wave in the near future, the health care system should accommodate cancer care with well-planned protocols so as to avoid late diagnosis and suboptimal therapy for cancer patients. One strategy to overcome this problem is to form clean areas within large hospitals or entire hospitals for cancer surgery to continue the treatment in a “cocooned” environment. Similar clean areas can be planned for follow up patients to avoid irregular follow up due to pandemic fear and disease progression or late detection of recurrence. Patients can also be followed up through telephonic conversation decreasing the number of visits and chance of infection. Considering the fact that the infection rate is high among the health care personnel in comparison to general population, more intensive campaigning may be done to vaccinate them and a possibility of giving a booster dose may be considered if acceptable.

Limitations

Limitations of current study were since study was an observational study, the differences in the effectiveness of institutional protocols were not assessed. The system-wise upstaging of the cancer patients was not assessed in our study.

CONCLUSION

The pandemic fear among the patients and the rising number of cases along with the measures to contain the same have disrupted the care for these cancer patients posing a risk of disease progression, late diagnosis and upstaging of the disease. There was 4 times increase in infection rate in second wave compared to first. Infection rate is high among health care personnel and vaccination coverage is suboptimal.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Epidemiology of COVID-19. Available at: https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19-11-may-2021. Accessed on 20 November 2021.
2. Eurosurveillance editorial team. Note from the editors: World Health Organization declares novel coronavirus (2019-nCoV) sixth public health emergency of international concern. Euro Surveill. 2020;25(5):200131e.
3. Subbiah S, Hussain SA, Samanth KM. Managing cancer during COVID pandemic experience of a tertiary cancer care center. Eur J Surg Oncol. 2020;7983(20):30799.
4. Maltezou HC, Dedoukou X, Tseroni M. SARS-CoV-2 Infection in healthcare personnel with high-risk occupational exposure: evaluation of seven-day exclusion from work policy. Clin Infect Dis. 2020;23:32-6.

5. Orlando MS, Chang OH, Russo MAL, Kho RM. Institutional protocols for coronavirus disease 2019 testing in elective gynecologic surgery across sites for the Society of Gynecologic Surgeons' Surgical Outcomes during the COVID-19 pandemic (SOCOVID) study. Am J Obstet Gynecol. 2021;224(5):540-2.
6. Iago D, Lima C, José C, Santos S. Impact of COVID-19 on cancer patients: A review; Asia-Pasific J Clin Oncol. 2020.
7. Liang W, Guan W, Chen R. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. Lancet Oncol. 2020;21(3):335-7.
8. Covid-19 vaccination and cancer patients. Available at: https://www.nccn.org/covid-19. Accessed on 20 November 2021.
9. Desai S, Gupta A. IASO COVID-19 Guidelines. Indian J Surg Oncol. 2020;11(2):171-4.
10. Priya R, Sengar M, Chinnaswamy G, Agrawal G, Arumugham R, et al. Impact of COVID-19 on cancer care in India: a cohort study. Lancet Oncol. 2021;22(7):970-6.
11. Dmitri N, Omar MO, Glasbey JC, Elizabeth L, Joana FFS, et al. COVID surg Collaborative. Collaborative Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans. Br J Surg. 2020;107:1440-9.
12. Dragos S, Smarandache CG, Tudor C, Duta LN, Dascalu AM, Aliuș C. Laparoscopic Surgery in COVID-19 Era-Safety and ethical issues. Diagnostics. 2020;10(9):673.
13. Jing Y, Wen O, Melvin LK, Chua, Conghua X. SARS-CoV-2 transmission in patients with cancer at a tertiary care hospital in Wuhan, China. JAMA Oncol. 2020;6(7):1108-10.
14. Berger JM, Gansterer M, Trutschnig W, Bathke AC, Strasslb M, Wolfgang L, et al. SARS-CoV-2 screening in cancer outpatients during the second wave of the COVID-19 pandemic conclusions for crisis response at a high-volume oncology center. JAMA Oncol. 2020.
15. Rajesh R, Aryan S, Verma MK. Characterization of the second wave of COVID-19 in India. BMJ. 2007;23:32.
16. Keep health workers safe to keep patients safe. Available at: https://www.who.int/news/item/17-09-2020-keep-health-workers-safe-to-keep-patients-safe-who. Accessed on 20 November 2021.
17. James TL, Althomsons SP, Hsiu W, Budnitz DS, Kalayil EJ. Disparities in COVID-19 vaccination coverage among health care personnel working in long-term care facilities, by job category, National Healthcare Safety Network United States March 2021. Health care J. 2020;70(30);1036-9.
18. Fırat T, Sinem K, Chinara A, Rafet Y, Murat YH. Delayed presentation of head and neck cancer patients during COVID-19 pandemic. Eur Arch Oto-Rhino-Laryngol. 2021;278:5081-5.
19. Amirmohsen J, Mohammad S, Habibollah M, Ramesh O, Amirhossein P, Amirsina S. One public health crisis into many others: the impact of COVID-19 on upstaging of gastric cancer research square. Eur Arch Oto-Rhino-Laryngol. 2021;23:43-9.
20. Haar J, Hoes LR, Coles CE, Seamon K, Fröhling S. Caring for patients with cancer in the COVID-19 era. Nature Med. 2020;26:665-71.

Cite this article as: Shanmugam S, Kumar DS, Muthuvel R, Jeevarajan SUD, Fells PS, Ananthakrishna SP. Impact of COVID-19 on care of cancer patients in department of surgical oncology under the Government of Tamil Nadu: a multicentre study. Int J Community Med Public Health 2023;10:182-7.