



Review article

Challenges faced in the cancer diagnosis and management—COVID-19 pandemic and beyond—Lessons for future

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ARTICLE INFO

Keywords:

Cancer
COVID-19
Corona virus
Diagnostic services

ABSTRACT

The COVID-19 pandemic with multiple waves of infection has caused panic and distress globally. Cancer patients being immuno-compromised are more susceptible to infection leading to increased morbidity and unpredictability of their survival. There has been a halt in the diagnosis and treatment of patients suffering from cancer because of the COVID-19 pandemic. Oncologists have the tedious task of assessing the urgency of managing cancer patients against the risk of Coronavirus infection. Timely diagnostic services along with the treatment strategy are needed for the proper management of cancer patients. Since the laboratories are already overwhelmed with the investigations related to the COVID-19 management, there has been a compromise and delay in the diagnosis, thus leading to an overall lag in the management of cancer patients.

1. Introduction

The COVID-19 pandemic has posed challenges to virtually every sector globally, including the economic, agricultural, telecommunication, transportation, and health-care systems [1]. The coronavirus disease has led to sudden shifts in healthcare facilities with the re-categorization of “essential” health care [2]. Cancer treatment is complex and the outcome of the patient depends on the early diagnosis and timely management. Although there are very little data on the incidence of COVID-19 in cancer patients, studies have noted that there is an increased fatality rate due to COVID-19 infection in cancer patients amounting to 5.6% cases compared to 2.1% in the general cohort in a Chinese study [1]. Similarly, a study from Italy has also noted an increased case fatality rate in patients with cancer [3]. This could be attributed to reduced immunity and susceptibility to infection in patients suffering from various types of cancers. Oncologist have to ensure timely, and proper cancer care while protecting themselves and the patients from getting exposed to the COVID-19 virus [4]. There is a major role of diagnostic services including laboratories and radiological investigations in evaluating prognosis, extent and rationalizing the treatment of cancer patients. COVID-19 has led to the halt and postponement of non-emergency services including diagnosis, surgery,

radiation therapy, as health care resources has been diverted in combatting the on-going pandemic. In March–July 2020, in comparison to March–July 2019, there was a substantial reduction in the number of cancer screenings, diagnoses, treatment, and surgeries, varying with the size and type, and place of diagnosis. At the peak of the pandemic, screenings and diagnosis for malignancies from breast, prostate, colon, and lung cancers were less by 85%, 74%, 75%, and 56% respectively in United States of America [5].

This review aims to enumerate and highlight the challenges faced by diagnostic laboratories for treatment of cancer patients to establish effective strategies in the pandemic era to deal with the shortcomings and provide better cancer care delivery services.

2. COVID-19 and its impact on laboratory services

Because of the on-going pandemic of COVID-19 and its multiple waves, there is a backlog of routine and diagnostic tests used for cancer patients. Diversion of resources to combat COVID-19, which is a priority now has resulted in reduced manpower that cannot meet the demands of cancer care [6].

World Health Organization (WHO) has noted in their interim report that laboratory staffs are exhausted because of the increased workload

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and the diversion made. Once the lab staff gets infected and are unable to perform their duties, there is a reduction in the manpower in an already ongoing shortage because of diversion [7]. Hospital healthcare workers and laboratory personnel including the doctors and the technologists, involved in providing diagnostic services face uncertainties with this on-going wave of infection. There is a fear of contracting the illness, in addition to maintaining safety at the workplace. The turn-around times (TAT) for routine tests have been significantly affected due to manpower constraints and shift duties of staff [7].

Diagnosis of cancer in children is even more difficult compared to adults which leads to delays in the management of such patients [8]. There can be a bias in the diagnosis as presenting signs of malignancy like fever, weakness, malaise, and respiratory symptoms can initially be mistaken for symptoms of COVID-19 infection. Apart from this, there is also a delay in the prognostic evaluation and management of known cancer patients because of the pandemic [9].

In countries like India, nationwide lockdowns and night curfews and in most of countries including south-east Asia, diversion of most of the healthcare facilities for COVID-19 management, has affected cancer treatment as well as the lab investigation part, which has led to delay in the diagnosis and its consequence in treatment initiation and follow up causing progression of the malignancy and poor survival [6]. The general population of India mostly receives cancer treatment in government institutions where the treatment charges are free or subsidized. Because of the overwhelming number of COVID-19 cases, many government facilities, including the cancer care centres have been turned into dedicated COVID-19 centres, posting laboratory staff to specifically work in the diagnosis of COVID-19 infection and management [6]. This has led to a major delay in the diagnosis. In a multi-centre study with participating centres from USA, Canada and United Kingdom, it was noticed that there was a 71% reduction in the number of complete blood counts performed and 57% fewer patients referred for specialist haematology review from primary care in 1 month since the lockdown was introduced. The numbers of bone marrow biopsies performed and immunophenotyping samples study has also been markedly reduced. There were 54% fewer cases of new haematological malignancies diagnosed in the pathology department during this interval [10]. This could be multifactorial including patients' reluctance to seek medical care, doctors' delay in provisional diagnosis and laboratories performing investigations perceived as non-urgent and reduced access to primary care [11].

In a study by London et al., they used TriNetX platform to analyze 20 health care institutions that have relevant, up-to-date data of cancer patients. Using this COVID and Cancer Research Network (CCRN), they compared cancer group identified by extracting information from a database table or combination of tables to gather encounter data pre-COVID (January 2019–April 2019) and current (January 2020–April 2020). Clear trends were identified that suggested a significant decline in all current cohorts explored, with April 2020 displaying the largest decrease in the number of patients with cancer. Of the cancer types analyzed, lung, colorectal, and hematologic cancer cohorts exhibited smaller decreases in size in April 2020 versus 2019 (−39.1%, −39.9%, −39.1%, respectively) compared with cohort size decreases for breast cancer, prostate cancer, and melanoma (−47.7%, −49.1%, −51.8%, respectively) (Table 1). In addition, cancer screenings declined drastically, with breast cancer screenings dropping by −89.2% and colorectal cancer screenings by −84.5%.

The number of new or metastatic cases diagnosed at Secondary Care Hospital Network during the pandemic in Italy in the year 2020 was substantially lower than in the same period in the previous 2 years. It was 300 in 2020 on average compared to 489 in 2018–2019, with a decrease of 39% in the cases. The number of cases with metastasis, pancreatic cancer and skin melanoma did not reduce, with minimal reduction in the lung (2%), slight in the stomach (10%), moderate in breast (26%) and reduction was however most marked in diagnosis of colo-rectum (62%), bladder (66%) and prostate (75%) cancer cases. The reduction was mostly in low-grade and intermediate-grade lesions [13]. There were a

lesser number of bladder cancer resections performed and colon resections done in 2020 to allow reliable assessment of prognostic data and the reduction in colorectal cancer diagnosis was considered the most alarming. The new diagnosis of breast cancer was reduced by 26%, due to a specific strategy aimed at preventing the mass screening procedures due to fear of spread of COVID-19. Prostate and bladder cancer underwent the greatest reduction with 75% and 66% cases reduction, respectively [14, 15].

French Breast Cancer Intergroup-UNICANCER (UCBG) has recommended that the screening programs for routine malignancy should be halted during the pandemic, and cases with BIRADS IV and above breast should be treated and surgical intervention in COVID-19 positive patients with low-grade tumours should be avoided [16]. A report from the UK stated that in cases of four major cancer-breast, colorectal, lung, and esophageal cancer 3291 to 3621 deaths and an additional 59,204 to 63,229 years of life lost were due to delay in the cancer diagnosis alone as a result of the ongoing pandemic and the accompanying lockdown [17]. There is a delay and halt of many routine lab investigations due to the fear of COVID-19 infection. Diagnostic tests like bronco-alveolar lavage (BAL) fluid investigations and rapid onsite evaluation test (ROSE) for early lung malignancy detection are being deferred.

Oral medicine and dentistry consultation had also drastically been reduced due to anxiety and uncertainty of current moment, leading to inappropriate epidemiological data on the incidence of oral cancer. Pandemic driven disruption of diagnostic and treatment facilities for oral cancer and other malignancies is likely to continue for a long time. Paradoxically, tobacco induced subset of oral cancer patients have an increased risk to contract and succumb to COVID-19 because of the upregulation of the ACE-2 receptor and the furine enzyme [18]. Discontinuation of a dental practice can negatively affect the role of dental surgeons and diagnostic facilities in the prevention and early diagnosis of premalignant lesions and invasive oral cancers. Appropriate interventions are immediately required by health care agencies in countries like India where burden of oral cancer is very high, for timely diagnosis and therapeutic interventions.

Routine PAP smear for screening, a simple yet diagnostic tool for diagnosis of premalignant and early stages of cervical cancer is also getting hampered as the patients are not coming for a routine check-up and follow-up. Fine needle aspirations have also been limited to urgent cases. There is a delay in performing biopsy for diagnosing malignant cases because of the mandatory RT-PCR needed for COVID-19 before doing this procedure. Similarly, the frozen section technique for histopathology specimens is kept on halt because of the fear of infection, which might increase the chances of recurrence of solid tumours in the future. Flow cytometry for typing and confirmation of haematological malignancies has been curbed. Haematological malignancies and cases of leukaemia are deferred during the pandemic leading to a major back log. Apart from affecting patient care, the COVID-19 pandemic has greatly hindered research and training activities due to the unavailability of staff and resources in this period of emergency [19, 20].

3. Current changes in the cancer diagnosis caused by the on going pandemic

Proper protective measures like the use of masks, proper hand hygiene, and social distancing to control the spread of infection should be advocated. Proper and regular use of the protective device by health care workers like face shields and PPE should be provided to ensure their safety.

WHO guidelines consider all specimens from body cavities like blood, swabs, body fluids, faeces must be considered potentially infectious, and appropriate personal protective equipment must be donned before obtaining samples or during processing such samples from any suspected patients of COVID-19 infection [13].

An air-purifying respirator should also be considered where aerosol-generating procedures like bronchoscopy, endotracheal intubation or

Table 1. Reduction in incidence and prevalence of COVID-19 cases (January 2020–April 2020) in comparison to the frequency of various malignancies during Pre-COVID-19 time (January 2019–April 2019) in a study by London et al. [12].

Type of cancer	Reduction in Prevalence of cancer cases	Reduction in Incidence of cancer cases
1. Melanoma,	–51.8%, and	–67.1%
2. Prostate cancer,	–49.1%,	–46.8%
3. Breast cancer	–47.7%	–50.5%,
4. Lung cancer	–39.1%	–46.8%;
5. Hematologic cancers	–39.1%	–54.2%
6. Colorectal cancer	–39.9%	–54.2%

(From: London et al. JCO Clin Cancer Inform. 2020).

centrifugation are routinely performed. It is recommended that during transportation of samples and histopathological or microbiological specimens, it should be tightly capped and transported to the main laboratory in biohazard zip-lock bags, and kept within a leak-proof cryo box with a visible proper biohazard label. The specimens should be hand-delivered rather than sending it through a pneumatic tube because of the risk of spillages [14]. Team segregation and social distancing should be practised everywhere in the hospitals and labs. This not only helps in lowering cross-infection between the teams but also allows them to perform their duties independently. Staggered meal times and deferment of group gatherings should be advocated and practised sincerely. Simple temperature taking, once or twice a day should be followed religiously to allow early identification of acute respiratory infection symptoms and proper quarantine of the person infected [19].

There should be a mass vaccination drive for one and all including both rural and urban areas. The slower spread would avoid stressing the health care system and allow high-risk cancer patients to receive proper routine medical care. To achieve this goal, elective imaging, diagnostic biopsies, etc need to be performed on priority for certain patients like symptomatic patients or those with metastasis to avoid chances of mortality in them. Home collection diagnostic services should be offered at the doorstep for people who are at risk of getting infected. Mobile testing vans are to be implemented for use in the whole country including rural areas. Health tracking mobile applications, government collaboration, and online services such as booking appointments online for preventive healthcare check-ups, delivering online reports via emails will further help cope with the post-pandemic situation [19].

Timely communication between healthcare workers and laboratory professionals in the hospital can help to reduce potential delay in the turnaround time for various investigations. A proper 24 × 7 phone service and laboratory email address, “WhatsApp” services and others should be provided to the clinicians to help them with queries and telephonic reports. There should be a shift from manual to paperless electronic requests to minimize the chances of unlabelled specimens or specimens without a proper request.

4. Balancing risks and benefits of diagnosis

There is a risk of getting infected by COVID -19, when the patient, especially who is immunocompromised visits the hospital for routine investigation or treatment or follow-up. But we as caregivers need to assess the risk-benefit ratio as delay in the diagnosis might lead to a grave situation. According to an Italian study, there should be an individualized evaluation of the risk-benefit ratio for palliative treatments especially for incurable metastatic disease, delaying radiological and pathological investigations for clinically stable patients. There should be a provision of remote follow-up with relevant investigations for patients with symptoms of disease progression limit the patient's and treatment givers' exposure from the deadly virus [20].

OncCOVID, a comprehensive web-based AI enabled software to estimate the risk of delaying the initiation of cancer treatment for an individual patient with cancer had been developed by Hartman et al. by quantitative integration of cancer mortality estimates and data on the consequences of treatment delay. The model uses known risk factors for COVID-19 such as patient age, r (reproduction) number, prevalence of COVID-19 in the locality and integrates it with data of patients with cancer of varying types and stages to estimate the risk for the patient. Approximate risk of delayed treatment for a particular patient is estimated based on individual risk profile taking into consideration epidemiological data regarding treatment delays and outcomes from patients with specific cancers [21].

5. Strategic maintenance of cancer diagnosis

As the pandemic evolves, we are accumulating novel knowledge and risk based clinical approach, and modifying some older approaches which will be very valuable for the oncologists and health care systems in general.

In a systematic Review by Riera et al., they identified 62 studies pertaining to delays and disruptions in cancer health care due to COVID-19 pandemic, most disruptions in management of cancer patients were due to reduction in service availability. There were 38 different types of delays leading to impact on treatment, diagnosis, or general health service. They noted that interruptions were mostly due to impaired, facilities (up to 77.5%), supply chain (up to 79 %) and personnel availability (up to 60%) [22].

There should be prioritization of surgery based on the histological diagnosis and the staging of the disease [23]. Precautions should be taken to reduce the number of hospital visits by the patients [24]. There should also be rationalization of investigations [13]. Remote interview through telemedicine in the form of audio or video calling to provide virtual outpatient clinics to patients has become a new routine practice where the risk of infection by going to the hospital has outweighed the benefits of in-person attendance to the clinic [25]. There should be a practice of individualized approach for choosing what is best for the patient based on his/her comorbidities, age, stage of the disease and convenience in coming to the hospital. The risk and benefits of calling patients for diagnosis and treatment should be compared with the potential of getting infected and should be decided after discussion with the patient and their family members.

6. Ensuring cancer diagnosis during the pandemic

With the current pandemic, in future there will be a significantly increased mortality in cancer patients due to irregular and inadequate cancer screening which will lead to more diagnosis of late-stage cancers with extensive invasion and tumor burden, more patients diagnosed in an emergency setting ultimately leading to delays in effective treatment of patients [26].

During and after a pandemic, triage decisions require even more coordination and communication among interns and specialists than at normal times. Post pandemic cancer care is expected to be a major challenge for oncologists as well as diagnostic providers because of the increasing number of cancer patients waiting for almost a year or more to resume or start treatment in an already strained healthcare system. Cancer patients will face the threats of not only delayed diagnosis of the disease and thereafter management but also the associated morbidities and complications. Available strategies followed by other developed nations on the management of the COVID-19 situation, along with providing cancer care should be adopted in India also, during the pandemic and in post-pandemic times [6, 20].

Health care policy should be adopted by various organizations and countries based on recommendations of diverse panel of experts in the

field of cancer management adopting a structured method to guide health care workers which will help them in facing the challenges of clinical and technical hurdles related to diagnosis, risk assessment, response assessment, surgical planning, radiotherapy and medical treatment during the COVID-19 pandemic. Ultimately these valuable information and strategy may help in facing the challenges smoothly and add up newer information as per the emerging strains and vaccine potency, and act as a knowledge repository for any challenges due to future pandemics [27].

New strategies and understandings will emerge with longer follow-up data to better understand the adverse effect of COVID-19 outcomes in patients with various malignancy at different stages, including the ability to continue specific cancer treatments at particular stages, so that the best-tailored strategies may be implemented [28].

7. Doctor's response to fight this crisis and futuristic strate

There is a need for an alternative approach if we want to continue with clinical services for cancer patients and to resume clinical research. Rather than a complete halt in screening services and deferral of diagnostic services, there should be a prioritization of the condition of the patient and proper workup [29]. After the initial surge of the pandemic the screening and diagnostic cancer services, must not be seen as “elective” and efforts should be made to ensure that cancer care should be given adequate attention and by getting cancer screening, early diagnosis, and treatment in a speedy manner [29]. Alternative testing by radio imaging, for example, computed tomography or less invasive and sophisticated testing methods like barium swallow instead of endoscopy or colonoscopy might be offered [30]. Mass screening by faecal occult blood test should be reintroduced to promote the triage of patients by physicians according to standard guidelines. Computed tomography colonography or double-contrast barium enema can be considered where there is excessive wait for colonoscopy. There should be use of immunohistochemistry, cytogenetics and molecular analysis of the gene assays which can be used as predictive markers preoperatively based on their known prognostic and predictive value. Ongoing re-audit may be of benefit for patients with suspected CRC [31, 32, 33]. Biomarkers are a simple way in early diagnosis of patients who are at greatest risk [29].

Tumor markers and Liquid biopsy should be initiated wherever possible. Cell block and the use of immunohistochemistry in more fine needle aspiration cytology (FNAC) samples should be undertaken, because tissue biopsy samples takes more time to be processed and reported. For education and training, remote video conferencing with on-line cloud computing and Webinars, for example, using apps like TEAMS, ZOOM meetings, etc for delivering seminars and google classes can be practised and conducted [33].

8. The major problem with cancer patients in COVID-19 era

There is increased risk of severe COVID-19 infection and related death for cancer patients, so it is very important to understand how COVID-19 infection affects cancer patients including the clinical behavior and potential risk factors of the disease, so that strategies, standard operating procedures and models may be established to reduce morbidity and mortality in patients suffering from cancer or being treated for cancer.

In a study by Russell et al., it was observed that increased risk of severe COVID-19 infection and related death for cancer patients was seen more commonly in male gender, people with asian ethnicity, hematological malignancies and those diagnosed with cancer for >2 years and they have recommended that these risk factors should be taken into account in the clinical management of these patients during the pandemic [34]. MacGregor et al., observed that patients with recent cancer treatment getting infected with COVID-19 infection had a significantly higher risk of adverse outcomes, and patients with no recent cancer treatment

had similar outcomes to those without cancer. Further, patients with metastatic solid tumors and hematologic malignant neoplasm had worse outcomes [35]. Yang et al. also noted that the patients with cancer were more susceptible to COVID-19 and those who had lung cancer had higher mortality compared to those without lung cancer. Therefore, it was hypothesized that cancer, in itself acts a risk factor for increased mortality among COVID-19 patients and suggested that clinicians should pay more attention to cancer patients diagnosed with COVID-19 [36].

It was commonly seen that during the pandemic, cancer patients found it difficult to go to tertiary hospitals and cancer centers for consultation, treatment and follow-up because of restrictions of movement and strict lockdown protocols especially in containment zones along with the inherent fear of contracting the disease and getting sick. Also in many countries, cancer centers were converted into COVID-19 centers with deployment of staff including laboratory personnel in them, further hampering the diagnosis, treatment and follow-up of patients. Further scarcity of hospital staff was seen due to staggering of staff, spread of infection among the health care workers and quarantine [37]. All these lead to increased suffering of cancer patients including the detection rate of newly diagnosed cases.

Pertaining to cancer patients, considerations should also be kept in mind regarding emergent variants, currently Omicron (B.1.1.529) variant has emerged as the dominant variant world over, although the severity and case fatality rate (CFR) of this variant is less in general population compared to the delta variant, the adverse impact of the current Omicron COVID-19 wave on cancer patients with advanced age, advanced tumors, and increased co-morbidities continues to be demonstrated, so appropriate stringent precautions are necessary in cancer patients in contrast to general population [38].

9. COVID-19 vaccination for patients with cancer: need and urgency

Currently most of the available data suggests that COVID-19 vaccination is safe in patients with cancer and reduces the risk of SARS CoV-2 infection. One study in USA found that cancer patients vaccinated against SARS CoV-2, were protected against infection in 58% of cases, two weeks after the second dose [39].

People who are suffering from cancer and/or are being treated for cancer including leukaemia and lymphoma may not elicit a powerful immune response to COVID-19 vaccines, so it is highly recommended that these people get an additional dose and a booster dose. An additional dose is not a booster dose; instead it is a part of primary vaccination which itself may include 2 doses and for some vaccines a single dose and some countries recommend 2 booster doses for people older than 18 years in this group [40].

As people with cancer have a higher risk of getting seriously ill, being hospitalized, and dying from COVID-19 (risk of dying or experiencing severe complications from COVID-19 are roughly two times higher in patients with cancer than a person without cancer), so it is very important that they get vaccinated against SARS-CoV-2 on priority basis and they should not wait even for booster doses. Recently, monoclonal antibody drugs have been recommended for those cancer patients who are immunocompromised and who have a weak immune response to the vaccine [41].

National comprehensive cancer network, recommends 3 vaccine doses (primary vaccinations) followed by 2 booster shots (total of 5 doses) for those who have received cancer therapy within last 1 year or newly diagnosed/recurrent cases or those with stem cell transplant/other cellular therapy [41]. Due to the fact that majority of COVID-19 vaccines are not live vaccine, they can be safely given to cancer patient during or after cancer treatment. There is no substantial evidence that COVID-19 vaccine have any adverse effect on patients receiving cancer therapy.

However, it is recommended that patients who just had a stem cell transplant or received CAR T-cell therapy and those who are on

immunosuppressive therapy should abstain from COVID-19 vaccination or from additional booster dose at least for three months after they have completed the treatment.

Even after full course of vaccination, if the patient is residing in an area where very infectious variants, such as Delta or Omicron are prevalent, wearing a mask indoors in public is highly recommended. It should always be kept in mind that no vaccine is 100% efficacious, and “breakthrough infection” can still occur. Although there are very low risks of breakthrough infection in general population and there are very low chances of getting very sick. But people who are suffering from cancer or are on anti-cancer therapy are at higher risk of illness from COVID-19, and it is highly recommended for them to wear mask in public places, especially indoor public places [41].

10. Future impact of the current situation on cancer diagnosis

Post-COVID-19 pandemic, there would be an increased surge in the number of patients, who were not coming for treatment and follow-up because of fear of getting infected. There is a fear of upstaging of cancer because of the delay in the diagnosis and follow-up [20]. The immediate priority is to save the lives of people and to protect them from an infection now but, in the recovery phase, evaluating the effects of COVID-19 on cancer morbidity and mortality is a concern.

A comprehensive evaluation of all cancer-suspected patients is needed for proper diagnosis and grading and staging of cancer which requires a combined initiative by diagnostic backbone of both radiology and histopathology. The COVID-19 crisis will eventually lead to upstaging of the disease, diagnosis at an advanced stage and thus will adversely affect patient outcomes. The quality of life will also be impacted as the health care facilities are burdened with COVID-19 leading to the allocation of medical personnel and resources to take care of COVID-19 patients. The gap in inpatient evaluation due to missed visits will lead to unnecessary investigations and pooling of work for assessment of disease at the time of next visit.

The current COVID-19 situation, has created positive interest for telemedicine and telepathology techniques to assist in the monitoring of cancer patients remotely. There have been increased efforts to sustain patient care and management and reduce the impact of the pandemic by innovative ways of telehealth visits, tele-diagnostics, remote patient management and patient care. There has been an increase trend of e-visits and virtual check up, especially by immunocompromised and cancer patients and old age people.

Patients suffering from cancer should be given priority for vaccination to decrease the risks of immunosuppressive therapies used in the treatment of COVID-19. As cancer patients do not have robust immune system and responses to vaccine, strategies should be made to reduce the gap between doses and prioritize them for booster doses.

There are high chances that after the decrease in the number of COVID-19 cases, there will be a huge rise in the demand for cancer clinics and raised number of diagnostics requests due to increased numbers of new patients along with restart treatments for existing postponed cases. There should be urgent planning and execution on how to manage the situation needed to deliver treatments for these patients. The reorganization of care will require adaptation of newer ways and regular review of the policies, and work will need to be restarted and managed well when we are emotionally and physically struggling at a low capacity.

In future to impede the effects of pandemic on management of cancer patients from laboratory point of view, following steps may be helpful: (1) ensuring uninterrupted diagnostic laboratory services for cancer patients, taking help of tele-pathology (2) the current pandemic must lead to the realization that there should be proper guidelines for the treatment of patients with cancer during pandemics (3) special management protocols for patients suffering from malignancy who have COVID-19 infection currently or in recent past (4) special screening programs of high risk population for cancer.

11. Conclusion

A return to the pre-pandemic era for health and health care services, especially for cancer care seems next to impossible. Adapting to a “new normal” state in cancer management is the need of the hour and will require regular and timely analysis of many psychological and economic aspects of cancer care to ensure the quality of healthcare access to patients suffering from malignancies. The Safety of patients and healthcare providers during and after the COVID-19 pandemic should be the priority of the healthcare sector and the government. There should be proper protocol and written SOP to deal with the new situation. Proper mass vaccination and covid appropriate behavior should be followed to reduce the chance of getting infected. It should be considered to reduce immunosuppression, even if COVID-19 is not ending. Rapid evaluations of practice when resources are rationed need to be taken care of to ensure optimal treatment options for cancer patients, rationalizing between essential and nonessential care. There should be technological modifications and up-gradation with the use of new modalities of treatment including telemedicine, remote investigations, home collection methods, telepathology, etc. according to the patient's situation even in rural areas. There is a need to perform an efficient workflow of screening, triage, proper diagnosis, and treatment, even after the pandemic is controlled which needs to be a combined effort from oncologist and diagnostics. There should be increased awareness and inculcation of appropriate personal protection provisions for both cancer patients and healthcare workers involved in patient care. Further research is needed in the field of cancer to deal with the new change.

Declarations

Author contribution statement

All authors listed have significantly contributed to the development and the writing of this article.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

No data was used for the research described in the article.

Declaration of interest's statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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