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Effect of the COVID-19 Pandemic on Cancer Treatment

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Abstract

Since being identified as a public health emergency of major international concern, the outbreak of coronavirus disease (COVID-19) in 2019 has rapidly spread globally and has now been declared a pandemic by the World Health Organization (WHO). COVID- 19 has the characteristics of rapid spread from person to person. Many cancer patients often go to the hospital for treatment and disease monitoring. They may have weakened immunity due to underlying malignant tumors or anti-cancer treatment, and the risk of infection is higher. There is an urgent need to address the impact of this pandemic on cancer patients. This includes changes to resource allocation, clinical care, and consent processes during a pandemic. Due to limited data, there are currently no international guidelines for the treatment of cancer patients in the infectious pandemic. In this review, we will

address the potential challenges of managing and treating cancer patients during the COVID-19 infection pandemic, and make some practical recommendations.

Introduction

The past decade has witnessed the outbreak of many life-threatening human pathogens; these include Nipah, Ebola, Zikungunya, Zika, Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and the newly emerging coronavirus (2019-nCoV or SARS-CoV-2). Disease states associated with the new coronavirus are called coronavirus disease (COVID-19). Coronaviruses, which appear regularly, continue to appear, posing a major threat to human health and the economy. Ironically, even after more than ten years of research on coronaviruses, there is still no licensed vaccine or therapeutic agent to treat coronavirus infection, which highlights the urgent need to develop effective vaccines or post-exposure prophylaxis to prevent future epidemics [1]. COVID-19 is currently the most common manifestation of respiratory symptoms and is widely spread throughout the world [2,3]. The transmission route is the inanimate object mediated through the nose, mouth, eyes, skin or others [4,5]. Exhaled breathing aerosol droplets are airborne and can remain in the air for a long time; therefore, direct inhalation of these aerosol droplets or contact with surfaces such as latex, steel, aluminum, or surgical gloves are possible transmissions of infected objects mode [6].

COVID-19 Pandemic Significantly Affects Cancer Patients

Some Reports suggested that patients with cancer had a higher risk of COVID-19 and with a poorer prognosis than those without cancer [7-9]. The risk of SARS-CoV-2 infection in cancer patients appears to be higher especially as they are more likely to present with an immunocompromised condition, either from the cancer itself or from the treatments they receive [9]. We believe that cancer patients are vulnerable to infection and have a poor prognosis. Analysis of the reason may be that cancer patients and their families need to go to the hospital repeatedly, and some patients need to be admitted to the hospital. Therefore, during the COVID-19 pandemic, the risk of exposure of the COVID-19 virus is significantly higher than the general population. Cancer patients are relatively old and have poor physical fitness. They often have a variety of underlying diseases, especially lung cancer patients. They have many underlying lung diseases and poor lung function. Once combined with new coronary pneumonia, the symptoms are often severe and the condition may deteriorate sharply. Furthermore, cancer patients are relatively older and have a slower understanding of the epidemic than young people, and have a poor ability to prevent the epidemic. Finally, due to the poor immunity of tumor patients after surgery, radiotherapy and chemotherapy or immunotherapy, the immune system has poor resistance and a high risk of infection [10]. The condition of cancer patients deteriorates and the prognosis of COVID-19 infection is poor [11]. We believe that cancer patients undergoing anti-tumor therapy should undergo targeted COVID-19 infection screening, and should avoid immunosuppressive treatment or reduce the dose of COVID-19 coinfection.

Treatment of Lung Cancer Patients During the COVID-19 Pandemic.

Lung cancer patients with oral targeted therapy drugs and stable condition must maintain the original drug treatment during the outbreak [12,13]. If the lung cancer patients with targeted therapy are stable, they can appropriately postpone the follow-up diagnosis and imaging evaluation according to the condition of the disease; with the spread of the new coronary pneumonia epidemic, cancer patients, especially lung cancer patients, once the new coronary pneumonia infection occurs, the symptoms are severe and the mortality rate is high. Lung cancer patients are the key targets of epidemic prevention [14,15]. Patients with lung cancer who receives anti-tumor therapy need to make a differential diagnosis carefully to assess the risk of new coronary pneumonia infection if they develop fever and respiratory symptoms. Protect patients to the greatest extent and effectively prevent the new coronary epidemic.

Treatment of Glioma Patients During the COVID-19 Pandemic

In many countries, elective surgery was cancelled during the peak of the new coronavirus pandemic. This influences the ability of many institutions to perform surgery [16]. For patients with low-grade gliomas that are less urgent, a reasonable delay in operation time is tolerable. For patients with more urgent glioblastomas that are more insistent, surgery should not be delayed [17]. Since magnetic resonance imaging (MRI) and computerized axial tomography (CAT) are critical to the diagnosis and monitoring of gliomas, they should be continued. However, glioma patients can consider increasing the interval between two scans to reduce the frequency of hospital visits.

Al-shamsi HO found that hypofractionated radiation therapy with concurrent and adjuvant temozolomide demonstrated the best outcomes in low and medium risk scenarios. In frail elderly patients, shorter course of radiation therapy was more appropriate[18,19]. Standard treatment of gliomas includes a combination of radiotherapy and chemotherapy [20-22]. For low-grade gliomas and anaplastic astrocytomas, the regimen usually includes radiation therapy of PCV or temozolomide chemotherapy. Low-frequency chemotherapy can increase by radiotherapy repair of damage caused by the immune system. Drug-assisted, when used in combination with temozolomide-assisted glioblastoma, the field of tumor therapy can potentially extend survival [23].

Special Focus on Digestive Systemic Cancer in COVID-19 Pandemic

There is still little information on how infection affects the liver and the relevance of pre-existing liver disease as a risk factor for acquiring infection or suffering from serious disease. Similarly, as information is generated, considerations in liver transplant patients or patients with hepatocellular carcinoma or undergoing immunosuppressive therapy are also being analyzed. Different treatments for COVID-19 are currently under study some of which may be associated with hepatotoxicity[24]. It can be reasonably expected that the risk of death or serious events of liver cancer patients infected with SARS-CoV-2 will increase [25]. The impact of COVID-19 in liver cancer patients who undergo surgery is still unclear due to the scarcity of available data. Decisions to postpone scheduled surgery for high risk patients must be made [26]. Liver transplant for patients with HCC has been severely impacted by the COVID pandemic. The

reasons for this are multiple including lack of anaesthetic capacity and ICU beds, and risk of nosocomial infection both to the donor and to the post-Transplant patient who may potentially be at greater risk for severe COVID infection due to immunosuppressive medication[27]. Tyrosine kinase inhibitors (TKIs) in liver cancer patients increase the risk of COVID-19. A decision to timely interrupt TKIs in suspected cases should be considered in order to avoid the harmful combination of the prothrombotic effects of both TKIs and SARS-COV2[28]. To protect patients and endoscopy unit personnel, endoscopy units have had to postpone a large proportion of endoscopic procedures. These delays might have an effect on the screening for and surveillance of digestive cancers [29]. Digestive systemic cancer is the most common malignancy. Most patients are diagnosed in the advanced stage with poor prognosis [30]. For malignant tumors, multidisciplinary treatment (MDT) is recommended, and non-surgical anti-tumor treatment should be preferred. Neoadjuvant therapy is strongly recommended for advanced gastrointestinal cancer that meets the indications of NCCN guidelines. Gastric or esophagogastric node (EGJ) malignant tumors with obstruction can be relieved by decompressing the gastric tube or placing a stent [31].

Under the New Coronavirus Epidemic, Treatment of Various Cancer Patients are Different

The common symptoms of patients with new coronary pneumonia are as follows: fever, dry cough, chest tightness, fatigue and comorbidities. The most common symptom is hypertension [32]. There are other clinical manifestations observed with COVID-19 infection, including the failure of multiple organs [33]. Is there a similar phenomenon in neoplastic pneumonia tumor patients? Although the impact of immune checkpoint inhibitors or tyrosine kinase inhibitors on risk and course of COVID-19 is unclear, the radiological characteristics of lung cancer or those related to these treatments may make the glass negatives cloudy, mimicking COVID-19 radiological characteristics [34]. Cancer patients infected with new coronary pneumonia are more likely to die [35]. Since both patients did not show symptoms of pneumonia at the time of surgery, but showed edema, protein exudates, focal reactive hyperplasia of lung cells and multinucleate giant cells with sheet-like inflammatory cell infiltration. In addition, the transparent membrane is not prominent. Therefore, these changes may represent the early stage of lung pathology of COVID-19 pneumonia in lung cancer [36]. A prothrombotic coagulopathy is commonly found in critically ill COVID-19 patients with acute respiratory distress syndrome (ARDS) [37]. Sometimes, drugs used to treat viral infections can also cause liver damage, which is called drug-induced liver damage [38]. Because the hepatitis virus exhibits excessive replication during SARS-CoV infection, SARS-CoV patients with susceptible hepatitis may be more susceptible to severe SARS-CoV infection. There is still little information on how infection affects the liver and the relevance of pre-existing liver disease as a risk factor for acquiring infection or suffering from serious disease[39]. However, it is reasonable to expect that the risk of death or serious events in liver cancer patients infected with SARS-CoV-2 will increase. The detection rate of esophageal cancer was high during the COVID-19 pandemic [40]. A pragmatic approach is for oesophageal cancer patients diagnosed with COVID-19 or experiencing symptoms consistent with it to avoid or delay thoracic radiotherapy [41]. Advice for patients with esophageal cancer is to enhance their own immunity and better resist possible virus invasion [42]. Communicate with cancer patients and support their mental well-being to help alleviate any anxiety and fear they may have about COVID-19 [43].

Cancer Patients Should Enhance Immunity During the COVID-19 Pandemic

Immunity is a natural barrier of the human body, not only can it resist the invasion of "enemy", but also maintain the internal stability of the human body. Tumor patients often have low immunity, and now the new type of coronary pneumonia is menacing.

To enhance immunity, nutrition should keep up. Tumor patients are liable to symptoms such as anorexia and early satiety due to diseases and treatments. They are often inadequate intake, causing or aggravating malnutrition. Malnutrition will further lead to weakening immunity, viruses are more likely to invade, and complications are more serious. Therefore, to ensure adequate nutrition should be the first. Due to the reduction in intake, patients with tumors are prone to nutritional imbalance, especially inadequate intake of vitamins, minerals, and dietary fiber. Vitamin D supplementation is recommended for tumor patients in isolation or outdoors. Foods rich in dietary fiber can improve constipation and maintain intestinal health. In addition to the above diet and nutrition recommendations, tumor patients should also pay attention to not dieting, weight loss, wash hands frequently, pay attention to personal hygiene, keep tableware clean and disinfect, pay attention to indoor ventilation, avoid long-term bed rest, and appropriate activities. Optimistic emotions and a peaceful mood will increase the body's antibody levels of influenza. Therefore, maintain a balanced state of mind and treat them rationally to alleviate bad emotions.

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