

Preventive Strategies for Cancer Patients during COVID-19 Pandemic: A Review

*Mozhgan Hashemieh¹

¹Pediatric Hematologist and Oncologist, Imam Hossein Medical Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Abstract

Immunosuppressed children with cancer remain a vulnerable group for acquiring severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Up to now, there is no specific antiviral agent or vaccine for this novel virus. Increased surveillance and preventive strategies are necessary in order to reduce the number of cancer patients who have been infected with Coronavirus disease (COVID-19). Education of patients, parents and health workers about these preventive strategies is of critical importance in reducing the risk of exposure to this virus. Consideration of risks and benefits regarding active intervention in the cancer patients during COVID-19 outbreak must be individualized case by case. Minimizing outpatients' visits and also reduction of elective admissions or surgeries can help in mitigating exposure and potential transmission. Additionally, the oncology community should balance a delay in cancer treatment against the risk of potential COVID-19 exposure. Limiting the exposure of cancer patients to clinics and departments and also modifying the therapeutic options in order to reduce the probability of myelosuppression, if feasible, could be the main goal. This review article summarizes the preventive strategies regarding cancer patients during this extraordinary time.

Key Words: Cancer, COVID-19, Neoplasm, Pandemic, Prevention, SARS-CoV-2.

*Please cite this article as: Hashemieh M. Preventive Strategies for Cancer Patients during COVID-19 Pandemic: A Review. Int J Pediatr 2021; 9(2): 12981-987. DOI: **10.22038/IJP.2020.51220.4069**

*Corresponding Author:

Mozhgan Hashemieh, MD, Imam Hossein Medical Center, Shahid Madani Street, Tehran, Iran.

Email: m.hashemieh@sbmu.ac.ir

Received date: Jul.10, 2020; Accepted date: Nov. 22, 2020

1- INTRODUCTION

All parts of the world are experiencing an outbreak of a novel beta corona virus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). WHO has announced that 2019 novel coronavirus disease (COVID – 19), caused by SARS-CoV-2 is a public health emergency that needs international concern (1). The rapid increase in the number of individuals who have been infected with COVID-19 in Wuhan, China, has shown us how quickly health system can be challenged to provide adequate care (2). COVID-19 infection may infect any individual, but this virus can cause a much more severe disease among immunosuppressed children such as those who receive chemotherapy (3). Patients with cancer are especially prone to respiratory viruses and severe pneumonia due to immunosuppressive state (4). Up to now there is no specific antiviral treatment or vaccine for COVID-19 (5). Therefore, patients need a higher level measure for care and prevention against COVID-19 (6). Regarding the increased rate of life-threatening complications and even death among patients with hematologic disorders who were infected with COVID – 19, preventive strategies have a significant role in this pandemic.

2- MATERIALS AND METHODS

In this review, an electronic search was performed on online databases of Scopus, EMBASE, Cochrane, Web of Science and Medline (via PubMed) with no language or time restrictions (up to August 14, 2020). The single and combination keywords of: "2019 novel coronavirus" OR "2019-nCoV" OR "COVID-19" AND "Cancer Care" OR "Prevention". The references of all included articles were searched to identify additional studies. The title, abstract and full text of all documents identified using these search criteria were screened by an

expert pediatric oncologist and those describing care of children with cancer during COVID-19 outbreak were finally selected. Overall, 76 articles could be originally identified using our search criteria, 62 of which were excluded after title, abstract or full text reading, because they did not correlate with care of children with cancer during COVID-19 pandemic. In this study, all review articles, cohort studies, retrospective analyses and randomized controlled trials about the main topic of article, were included. Pilot, preliminary and case report studies were not included due to limited sample size and a higher risk of bias. All studies that were not related to the subject, or were duplicate were excluded.

3- RESULTS

A total number of 14 studies was finally selected. The results of these studies have been classified in 3 groups: vulnerability of children with cancer to COVID -19, care of children with cancer during COVID-19 outbreak and preventive strategies in children with hematologic disorders in this pandemic.

3-1. Vulnerability of cancer patients to COVID – 19

Cancer patients are vulnerable to COVID – 19. Although children in comparison to adults have a milder course of COVID -19 infection, pediatric patients with malignancies had a higher risk for severe clinical events due to COVID -19 in comparison to children without cancer (7). Both anti-cancer therapy such as chemotherapy, radiotherapy and hematopoietic stem cell transplantation (HSCT), and primary neoplasm could suppress their immune system and hence vulnerability to COVID – 19. It has been shown that receiving anti – tumor therapies within 14 days ago, were significantly associated with severe clinical events in SARS-CoV-2 infection (4). Fortunately, respiratory viruses such as COVID - 19

have never been reported to be transmitted via blood or blood products and the risk of transmission by transfusion is only theoretical (8). In hospitalized COVID -19 patients, particularly critical forms, close monitoring of WBC count, lymphocyte count, platelet count, serum ferritin and other markers of systemic inflammation is necessary (9). Cancer patients harbor the pathogen for a longer duration. Therefore, these cases become a reservoir for viral spread in community. Oncology patients require multiple hospital admissions during COVID-19 outbreak; hence it is almost impossible to keep them under quarantine situation. Moreover, the course of infection in these immunocompromised cases is not the same with immunocompetent host. In other words, these patients do not follow the natural course of disease as seen in general population (10).

3-2. Higher fatality rate among cancer patients with COVID – 19

In a study from China it was shown that cancer patients with COVID-19 disease had 3.5 times higher need for mechanical ventilation or ICU admission or death compared to patients without cancer (1). Wu and McGoogan in another study reported that the incidence of case fatality among cancer patients was 5.6% compared with 2.3% in general population (11). Also, in a recent study from Italy which has been done on 1257 patients on active treatment, it was demonstrated that 9 cancer patients and 3 cases of health workers have been infected with COVID – 19. The mortality rate of cancer patients was reported 22%. According to higher rate of serious complications and even death among cancer patients who were infected with COVID – 19, preventive measures and strict isolation have an important role in these cases (12).

3-3. Preventive strategies

Preventive strategies by the oncology staff, department of pediatric hematology and oncology, parents of children with cancer and patients themselves are mandatory in order to mitigate the number of infected cancer patients by SARS-CoV-2 (13). Regarding the high hospitalization rate of patients with cancer, nosocomial transmission is one of the main routes of viral spread during COVID-19 outbreak. Hence, treating cancer patients in an outpatient setting instead of hospitalization is preferable whenever feasible. Also, implementing strict infection control both in hematology-oncology wards and clinics should be performed in order to better control COVID-19 among patients with cancer (14). Some preventive measures are general options and the others are specific for patients with cancer (13). Cancer patients, based on their disease stage, require different strategies. Approach to patients in early stages of cancer in comparison to patients with metastatic disease should be performed in different routes (curative versus palliative setting). The most important recommendations for daily practice in order to care for cancer patients during COVID-19 outbreak include:

- 1) Prevention of contamination,
- 2) Prioritization of patients by favoring curative therapies versus palliative,
- 3) Avoiding overcrowded clinics,
- 4) Separation of the oncology department,
- 5) Management of patients who need supportive care (13).

3-4. General recommendation for patients

The prevention strategies for patients consist of:

- Avoiding crowded places,
- Washing hands according to WHO recommendation,
- Using sanitizer,
- Using gloves,

- Wearing proper masks when going to clinic or hospital,
- Social distancing with all people,
- No contact with family or friends with COVID-19 symptoms,
- Report any new symptoms such as fever, cough or shortness of breath by telephone to their medical team (13).

3-4-1. Recommendation for health system managers

Health system managers in cancer centers should decrease the duration of hospital stay for patients, limit the number of patients' companions and check the body temperature of patients and companions at the entrance of wards (6).

3-4-2. Recommendation for oncologists

Adult and pediatric oncologists have an important role in COVID-19 outbreak to mitigate the risk of anti-cancer treatment. At first, clinicians should talk to patients and their families about the benefits or disadvantages of chemotherapy and radiotherapy (6). In situations that the benefits of chemotherapy outweigh the disadvantages of probable infection with SARS-CoV-2, the oncologists should consider the following strategies:

- 1) Clinicians should use outpatient chemotherapy regimens instead of inpatient protocol.
- 2) Prescribe chemotherapy regimens with longer intervals and therefore reduce the number of courses.
- 3) When feasible, use lesser myelosuppressive protocols or single agent chemotherapy instead of multi agent protocols (15).
- 4) Use of prophylactic granulocyte colony stimulating factor (G – CSF) to limit neutropenic period (13).
- 5) Consider switching intravenous chemotherapy to oral anti-cancer drug without compromising the prognosis of patients (16).

6) Postponing the screening services for asymptomatic patients has also been recommended (6).

7) Curative surgeries should be carried out as usual, because any delay in treatment could compromise the outcome of children with cancer (6).

Recently telemedicine has been proposed to support patients remotely in order to reduce hospital visits during COVID-19 outbreak (17). Telemedicine has been shown to improve cancer care and also reduce health care costs. Furthermore, patients who do not receive active chemotherapy are good candidates for telemedicine follow-up. However, the facilities and tools which are required in telemedicine, especially in underdeveloped countries, particularly in a pandemic setting, may be limited (17).

3-4-3. Recommendation for nurses

All of the nurses who are working in cancer clinics or oncology departments should wear a mask (preferably N95), especially when entering a room where patients with suspected or confirmed COVID-19 are admitted. However, the use of mask alone is not sufficient to provide an appropriate protection and other measures should be taken (18). Moreover, nurses in outpatient and inpatient oncology wards who are in close contact with patients should use gown and goggles (15). If nurses who are working in oncology wards show any suspicious signs of COVID-19 infection, they should exit the team (6). One of the most important decontamination policies is division of the radiotherapy and chemotherapy wards into zones with different contamination levels including clean, semi clean and contaminated. The examination rooms and the waiting spaces are the contaminated zones. Chemotherapy nurses station and the radiotherapy technicians station are semi clean zones. The radiotherapy room and chemotherapy bed are clear zones. Moreover, all of patients before attending

in oncology clinics or wards should be screened for probable signs of COVID-19 via telephone call by a trained nurse (6).

3-5. Challenges of cancer care during COVID – 19 outbreak

During this COVID-19 outbreak, many health care systems are facing challenges regarding the care of cancer patients. In this period, the main goal in clinical practice should be the care and treatment of as many patients as possible with the appropriate use of the available resources. When faced with limited resources, a cancer multidisciplinary team must decide which patients will receive critical care according to the expected prognosis. During this outbreak, clinical judgment is necessary in order to make a decision about cancer treatment in patients with suspected or documented COVID-19 (16). However, the diagnosis and also treatment of oncology patients should not be compromised during COVID-19 pandemic. The necessity of any procedure in cancer patients should be balanced against the increased risk during this outbreak and must be individualized on a case by case basis (16). Additionally, many patients were afraid of entering a clinic or hospital for fear of acquiring infection and some patients stopped all therapeutic modalities such as chemotherapy or radiotherapy due to this concern (19). Outpatient visit for oncology patients must be reduced to the safest level without compromising patient care and necessary treatments, especially in early stages of cancer. Furthermore, in patients with advanced or metastatic disease, decision making should be different (16). In contrast to adulthood cancer, many childhood neoplasms have a progressive course and require multiple hospitalizations in the treatment course of their primary illness. In adult patients with some types of cancer, the course of disease is indolent; hence the delay in chemotherapy, particularly for the early

months of COVID-19 outbreak, could not lead to a major problem in them (20). The parents of children with cancer need to know that chemotherapy could carry a greater risk during this extra-ordinary time and also access to hospital beds will be mitigated due to increase in demand and health worker shortage. In these situations, the oncologist may make another decision in order to choose a less myelosuppressive chemotherapy regimen. However, the risk of surgery may be associated with increased risk of nosocomial infection with SARS-CoV-2 infection. On the other hand, one of the challenges of delaying the elective surgeries is the uncertainty regarding the end of this pandemic (16). During this outbreak, patients with cancer who have documented infection with SARS-CoV-2 virus, should be evaluated for postponement of chemotherapy until they become clear according to WHO and CDC recommendations (21, 22). Occasionally health workers are needed to self – isolate due to contact with a documented case of COVID-19 (16). During this outbreak, the oncology community faces many unpredicted challenges; therefore oncologists could balance a delay in cancer diagnosis or treatment against the risk for a potential COVID-19 exposure. Also, the management of suitable allocation of limited health care resources in this time is mandatory (23).

4- CONCLUSION

Immunocompromised children with cancer have vulnerability for acquiring SARS-CoV-2 infection. Preventive strategies by the patients and their families, oncology staff, hospitals and clinics are mandatory in order to reduce the number of infected cancer patients by COVID–19. During this outbreak, oncology community faces many challenges regarding cancer patients and should balance a delay in cancer treatment

against the risk for potential exposure to this novel virus.

5- CONFLICT OF INTEREST: None.

6- REFERENCES

1. Liang W, Guan W, Chen R, Wang W, Li J, Xu K, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol.* 2020;21(3):335-37.
2. Murthy S, Gomersall CD, Fowler RA. Care for Critically Ill Patients with COVID-19. *JAMA.* 2020;10.1001/jama.2020.3633.
3. Hrusak O, Kalina T, Wolf J, Balduzzi A, Provenzi M, Rizzari C, et al. Flash survey on severe acute respiratory syndrome coronavirus-2 infections in paediatric patients on anticancer treatment. *Eur J Cancer.* 2020; 132:11-16. doi: 10.1016/j.ejca.2020.03.021
4. Zhang L, Zhu F, Xie L, Wang C, Wang J, Chen R, et al. Clinical characteristics of COVID-19-infected cancer patients: a retrospective case study in three hospitals within Wuhan, China. *Ann Oncol.* 2020; S0923-7534(20):36383-3.
5. Al-Quteimat OM, Amer AM. The Impact of the COVID-19 Pandemic on Cancer Patients. *Am J Clin Oncol.* 2020;43(6):452-55.
6. Motlagh A, Yamrali M, Azghandi S, Azadeh P, Vaezi M, Ashrafi F, et al. COVID19 Prevention & Care; A Cancer Specific Guideline. *Arch Iran Med.* 2020;23(4):255-64.
7. Hashemieh M. COVID -19 in Children with Cancer: A Review. *Int J Pediatr* 2020. Online ahead of Print. doi: 10.22038/IJP.2020.51016.4052
8. Hashemieh M. Blood Safety in SARS-CoV-2 Infection. *Arch Pediatr Infect Dis.* Online ahead of Print; 8(3): e104525.
9. Hashemieh M. Hematologic Parameters of COVID-19: A Review on Alteration of Hematologic Laboratory Findings. *Int J Pediatr* 2020; 8(9):11921-929.
10. Bansal N, Ghafur A. COVID-19 in oncology settings. *Cancer Research, Statistics, and Treatment.* 2020; 3(5):13.
11. Wu Z, McGoogan JM. Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases from the Chinese Center for Disease Control and Prevention. *JAMA.* 2020; 10.1001/jama.2020.2648.
12. Omarini C, Maur M, Luppi G, Narni F, Luppi M, Dominici M, et al. Cancer treatment during the coronavirus disease 2019 pandemic: Do not postpone, do it! *Eur J Cancer.* 2020 May 12; 133:29-32.
13. Bitar N, Kattan J, Kourie HR, Mukherji D, Saghir NE. The Lebanese Society of Medical Oncology (LSMO) statement on the care of patients with cancer during the COVID-19 pandemic. *Future Oncol.* 2020;16(11):615-17.
14. Al-Quteimat OM, Amer AM. The Impact of the COVID-19 Pandemic on Cancer Patients. *Am J Clin Oncol.* 2020;43(6):452-55.
15. Weinkove R, McQuilten ZK, Adler J, Agar MR, Blyth E, Cheng AC, et al. Managing hematology and oncology patients during the COVID-19 pandemic: interim consensus guidance. *Med J Aust.* 2020; 212(10):481-89.
16. Al-Shamsi HO, Alhazzani W, Alhurairi A, Coomes EA, Chemaly RF, Almuhanna M, et al. A Practical Approach to the Management of Cancer Patients during the Novel Coronavirus Disease 2019 (COVID-19) Pandemic: An International Collaborative Group. *Oncologist.* 2020 Apr 3. doi: 10.1634/theoncologist.2020-0213.
17. Sirintrapun SJ, Lopez AM. Telemedicine in Cancer Care. *Am Soc Clin Oncol Educ Book.* 2018 May 23; 38:540-45.
18. World Health Organization. Advice on the use of masks in the community, during home care and in healthcare settings in the context of the novel coronavirus (2019-nCoV) outbreak: interim guidance, 29 January 2020. World Health Organization; 2020.
19. Chen YM, Perng RP, Chu H, Tsai CM, Whang-Peng J. Impact of severe acute respiratory syndrome on the status of lung cancer chemotherapy patients and a correlation of the signs and symptoms. *Lung Cancer.* 2004;45(1):39-43.
20. Kotecha RS. Challenges posed by COVID-19 to children with cancer. *Lancet Oncol.* 2020; 21(5): e235.

21. World Health Organization. Coronavirus disease (2019-COVID-19) technical guidance: Patient management. Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/patient-management>. Accessed March 4, 2020.

22. Centers for Disease Control and Prevention. Interim clinical guidance for management of patients with confirmed coronavirus disease (COVID-19). Available at: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>. Accessed March 4, 2020.

23. Kutikov A, Weinberg DS, Edelman MJ, Horwitz EM, Uzzo RG, Fisher RI. A War on Two Fronts: Cancer Care in the Time of COVID-19. *Ann Intern Med.* 2020; 172(11):756-58.