

Editorial

Chemotherapy and COVID19; Administration of Chemotherapy at Home

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Editorial

Cancer patients are of the most vulnerable groups with the greatest risk of death from COVID-19 secondary to the defects in their adaptive as well as the innate immune system. Given their heightened risk of acquiring and poorer outcomes of COVID-19, the recommendation to 'stay at home' applies more to those patients more than any other group. On the other hand, the receipt of scheduled cytotoxic therapy remains a major problem for cancer patients. Venturing to reach cancer centers to receive their scheduled doses poses a high risk of infection and mortality from the virus.

Due to the pre-occupation of healthcare providers secondary to the outbreak, a more direct contribution to the process of chemotherapy administration should be provided by caregivers. In developing countries, the administration of chemotherapy at home is uncommon due to many logistic and financial constraints.

The first step in the assessment of cancer patients is deciding whether treatment may be delayed or not. Patients that are treated with curative intent (Adjuvant / Neoadjuvant in breast or colon cancer) should receive the most effective treatment immediately regardless of the risk of acquiring the infection. However, minor modifications of the protocol may be implemented to decrease the number of sessions and hence the need for admission to a healthcare facility and the frequency of monitoring. Patients with aggressive hematologic malignancies (e.g., Burkitt's leukemia/lymphoma) and patients undergoing hematopoietic stem cell transplantation should also commence treatment immediately in an inpatient setting, although autologous stem cell transplantation for multiple myeloma and lymphoma may be performed safely at home if patients are expected to be compliant, proximal to a cancer center for potential visits and admission, 24-hour caregiver support, favorable performance status, and comorbidity profile [1]. For patients with advanced/metastatic disease, delaying treatment may lead to worsening of the performance

status and loss of the opportunity of appropriate treatment and should be individualized on a case-by-case basis [2].

Although no reference criteria guiding the decision of which patients are eligible for receiving treatment at home, clinical prognostic tools such as the Eastern Cooperative Oncology Group (ECOG), Karnofsky Performance Status (KPS) and International Prognostic Index (IPI) may be used to determine the fitness of patient to chemotherapy and decide whether the patient may receive chemotherapy in an outpatient or inpatient setting.

Patients living in urban or semi-urban areas are the best candidates to receive chemotherapy at home. Easy access to the closest healthcare facility must be established for the management of any life-threatening complications. Moreover, patients must be provided with direct contacts of their primary healthcare provider and the oncology resident in the nearest specialized healthcare facility.

Cancer centers within which patients are affiliated should have a convenient, controlled and safe transportation means of Compounded Sterile Preparations (CSPs) and measures taken to maintain and assures the stability of CSPs until they are delivered to their target destination. If cancer centers are unable to deliver chemotherapy to patients, chemotherapy may be delivered by caregivers with a thorough education on safe handling and appropriate storage conditions.

Decontamination of chemotherapy as soon as it arrives at the target destination through wiping the exterior surface of the CSPs with 70% alcohol before administering the drug to the patient is strongly advised to prevent the transmission of COVID-19 if any of the medical staff that handled the preparation is asymptotically infected and undetected.

The role of oncology pharmacists is crucial in this area, where, she/he may provide support to patients treated at home through assessment of drug-drug interactions, educating the patients and their caregivers about the possible complications and adverse events of the administered chemotherapeutic drugs and provide support regarding infusion rates and stability of the SCPs. Oncology pharmacists are also aware and experienced with vascular access

problems and ambulatory infusion pumps failures, besides, they may assist patients and their close contacts through telecommunications to patients in distant locations.

It is worthy to mention that, establishing convenient vascular access is the most important aspect of safe outpatient chemotherapy administration. In most instances, a peripheral cannula is sufficient and caregivers may easily learn how to insert and remove in emergency

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cases where nursing home is not available for any crisis or outbreaks. Central venous catheters (tunneled or non-tunneled) are not preferred for outpatient chemotherapy administration since they are associated with tunnel and exit site infections and should be changed regularly. If the patient is to receive a vesicant (e.g., Anthracycline), implantable ports are preferred. As an additional precaution in case of emergency, crisis or outbreaks where it will be impossible for home nursing, the caregivers are to be very well-educated and trained on how to fit the needle of the port, heparin-flush the port before and after chemotherapy administration, also, both the patients and caregivers should be aware of the signs and symptoms of port infections.

Many strategies could be implemented to simplify the course of treatment include substituting intravenous agents with oral agents, substituting protocols utilizing long infusions with shorter ones, avoiding regimens with a high incidence of neutropenia requiring Colony-Stimulating Factor (CSF) support, substituting more toxic drugs with less toxic drugs, choosing regimens with longer time between cycles and changing the schedule if feasible. Any modifications to protocols should not significantly affect the desired goal of therapy. For example, Fluorouracil may be substituted for Capecitabine in patients with metastatic colon cancer [3], recurrent or Stage IV (M1) breast cancer [4], patients receiving perioperative chemotherapy for gastric cancer [5], Enzalutamide or Abiraterone in favor of Docetaxel in castrate-resistant prostate cancer without compromising the efficacy of treatment [6].

Protocols that require CSF support such as Neoadjuvant/Adjuvant Dose-dense Doxorubicin plus Cyclophosphamide followed by weekly Paclitaxel for breast cancer (AC-P) and Docetaxel plus Cyclophosphamide (TC) are strongly discouraged since neutropenic fever may occur despite CSF support that requires hospitalization in high-risk patients. In the case of dose-dense AC, it is acceptable to change the administration sequence to Paclitaxel followed by dose-dense AC and Filgrastim support, which will follow Paclitaxel after 12 weeks, during which the outbreak may subside [7]. Similarly, in patients with diffuse large B-cell lymphoma, R-CHOP is preferred over dose-dense R-CHOP and dose-adjusted EPOCH due to lower incidence of neutropenia and no need for CSF support [8].

Considering less intense regimens with longer time between cycles are strongly encouraged. For example, Paclitaxel 175 mg/m² IV infused over 3 hours every three weeks may be more convenient to weekly paclitaxel (80 mg/m² IV over 1 hour) in breast and ovarian cancer patients [9,10]. Trastuzumab 6 mg/kg IV over 30 minutes every 21 days may be a better choice to weekly Trastuzumab (Trastuzumab 4 mg/kg IV over 90 minutes with the first dose of paclitaxel, then 2 mg/kg IV over 30 minutes weekly) [10].

Patients should be regularly monitored for adverse events, signs and symptoms of disease improvement or progression before each cycle and should be considered in case dose adjustment as required. Patients receiving a cytotoxic agent that are highly correlated to anaphylactic reactions (e.g., Taxanes, Pemetrexed, Chimeric Monoclonal antibodies) may be admitted to the nearest cancer center to receive the first dose and if uneventful, the rest of the cycles may be administered at home under close observations from the health care providers proven to be negative COVID-19 infection and appropriate premedication. Both patients and caregivers should be aware of the potential of immediate hypersensitivity reactions, be able to recognize and report it once occurred and the way to provide initial management until transfer to the emergency department.

Electronic consultations are an attractive option for monitoring, management, diagnosis, and counseling of patients through interactive telemedicine services, which provide real-time interactions between healthcare providers and patients, in addition, videoconferencing is widely implemented in many clinical disciplines and is potentially useful in this setting.

In summary, outpatient chemotherapy administration is challenging but possible and should be strongly nowadays. Expertise in chemotherapy prescribing, education programs for patients and their caregivers, and effective communication between healthcare providers and patients are all essential for the success of outpatient chemotherapy administration and mitigating the risk of COVID-19 infection in cancer patients.

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