



Research Article

Scoring System for Patients with Cancer to Weigh Risk/Benefit of Chemotherapy During Outbreak of COVID-19

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ABSTRACT

Coronavirus disease 2019 (COVID-19) is impacting our daily practice. Hematologist and oncologist around the globe are concerned and many physicians are hesitating to start/continue antineoplastic treatment in patients with cancer to protect them from severe complications in case of infection with the new novel corona virus. Therefore, we feel there is a high demand for scoring system to guide and help physicians dealing with patients with malignant diseases to take the correct decision. We have designed a scoring system to evaluate patients with cancer requiring anti-cancer treatment and we have started to implement it at our hospital. Therefore, we would like to share this scoring system with the community.

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Scoring System

Vast majority of world countries are still reporting on significant number of new patients infected daily with the new virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Patients on immune suppressive therapy are at higher risk of infection and serious complications [1]. There have been different recommendations from several hematology/oncology societies on how to handle cancer patients in need of anti-neoplastic treatment during the outbreak of COVID-19. Many of these recommendations are difficult to follow and lack of practicality. To our knowledge there is no definitive scoring system to use as clear guidance on how to manage such patients.

In attempt to simplify decision making for our physicians treating patients with cancer, we designed a scoring system to assess and balance the risks and benefits of chemotherapy in patients with cancer during outbreak of COVID-19. This scoring system is taking in consideration many factors including patients' related factors, treatment type, hospital related issues and others. It enables hematologists and oncologists to better weigh individual risks vs benefits of initiations, rescheduling or

changing an indicated treatment. Positive points will be added together. Negative points will be subtracted from positive points to get the final score.

Interpretation

Patients with final score ≥ 14 : All patients reaching a score of 14 and more are at higher risk to develop cancer related complications. The benefits of systemic chemotherapy outweigh the risk of development of complications. Therefore, anti-cancer treatment may be initiated in this group of patients.

Patient with score < 14 : All patients with a score less than 14 are at lower risk of imminent cancer related complications. The benefits of systemic chemotherapy during COVID-19 outbreak do not outweigh the risks of complications in case patients got infected with the new Corona virus. Therefore, anti-cancer treatment shall be deferred. Patients shall be evaluated every 4-8 weeks and the scoring system might be applied again to re-evaluate treatment decision.

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Table 1: Scoring system for patients with cancer to weigh risk/benefit of chemotherapy during outbreak of COVID-19.

Supporting chemotherapy					Discouraging chemotherapy				
	+4	+3	+2	+1	Factor	-1	-2	-3	-4
TUMOR	Curative	x	x	x	Therapy intention	x	x	x	Palliative
	High				Acuity of type and manifestation				Low
	High				3 m risk of relapse / progression				Low
TREATMENT	High				Improvement of OS				Low
	High				Improvement of TTP				Low
	High				Estimated response				Low
	Major complications expected				Safety of delaying treatment to affect end outcome				Safe
	Low				Risk of immunosuppression				High
COVID19	Low				Risk of COVID19 infection (region, family..etc)				High
	Low				Estimated risk of death in case of COVID19 infection (age, current condition.etc)				High
PATIENT	None				Comorbidities influencing course of possible COVID19 infection				Significant
	Close (<1h)				Distance to tertiary care hospital				Very far (>2hrs)
	High				Patient's complaine				Low
HOSPITAL	Outpatient	x	x	x	Delivering treatment	x	x	x	Inpatient
	Excellent				Beds availability				Major shortage
	Excellent				Staff availability				Major shortage
	Low				Risk to be infected inside hospital				High

Abbreviations: 3 m: 3 months; OS: overall survival; TTP: time to progression.

Example 1

A 55-year-old lady with newly diagnosed triple negative fungating breast cancer. She has well controlled diabetes mellitus. She lives in a city with just few persons tested positive for COVID-19 and needs 20 minutes to reach her tertiary care hospital which has moderate shortage of beds and staff. Additionally, several staff members of this hospital were infected with COVID-19. The breast surgeon advised against initial surgery. The tumor board recommended for neoadjuvant chemotherapy and her primary physician thinks on starting her on docetaxel and cyclophosphamide.

We would give following points to the above 17 parameters included in the scoring system:

4, 4, 4, 2, 3, 3, 3, 2, 3, 3, 3, 4, 4, 4, -2, -2, -4.

Positive points: 46

Negative points: -8

Final score: 46-8= 38, which is clearly >14.

The calculated final score in this example is in favor of proceeding with the chemotherapy.

Example 2

A 75-year-old man with chronic obstructive lung disease and history of stroke, was diagnosed with follicular non- Hodgkin lymphoma stage

IIIA. GELF criteria (Groupe d-Etude des Lymphomes Folliculaires) were fulfilled [2]. However, there is no organ compression, pain or effusions. The patient lives in a city with pandemic spread of COVID-19 and he needs around 90 minutes to reach the hospital. He is moderately complaint and is concerned to come to hospital because many patients with COVID-19 are admitted for treatment. In addition, several staff members of the hospital were recently diagnosed positive for COVID-19. Despite having enough staff, the hospital declared shortage of beds in the intensive care unit. Two of his neighbors were also positive for COVID-19. According to local hospital guidelines outside outbreak of COVID-19, such patients would be initiated on immune chemotherapy with obinutuzumab and bendamustine.

We would give following points to the above 17 parameters:

-4, -3, -3, 4, 4, 4, -4, -3, -3, -3, -4, -2, -2, 4, -4, 4, -2.

Positive points: 20

Negative points: -37

Final score: 20-37= -17, which is clearly less than 14.

The calculated final score in this example is in favor of delaying the chemotherapy.

Example 3

Now after 3 months the same patients in example 2 came to the hospital with progressive disease (pain and shortness of breath). The hospital has

recovered from COVID-19 surge.

Applying the scoring system to the new situation resulting in following:

-4, 4, 4, 4, 4, 4, 4, -3 -3, -3, -4, -2, -2, 4, 4, 4, 3

Positive points: 39

Negative points: -21

Final score: 39-21= 18, which is higher than 14.

The new changes on side of the disease and the hospital resulted in a higher final score (18). Therefore, treatment with obinutuzumab and bendamustine might be started. However, other less immunosuppressive regimens might be discussed i.e. single agent rituximab. Through usage of such less aggressive regimens the risk of immunosuppression and complications will be reduced which will automatically increase the calculated final score.

Conclusion

We think that our scoring system is robust in many scenarios. Furthermore, it might help in case of difficulties in taking a decision pro

or contra initiation/continuation of chemotherapy in patients with different malignant diseases during the outbreak of COVID-19.

Conflicts of Interest

None.

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