บทบรรณาธิการ

Febrile Neutropenia

Nonglak Kanitsap
Hematology Division, Department of Medicine, Thammasat University

Febrile neutropenia which defined as the body temperature of more than 38.3°C or more than 38.0°C and persisting for one hour plus neutropenia, absolute neutrophil count of lower than 500/μL or lower than 1,000/μL with a trend to be lower than 500/μL in 48 hours is a high treatment related mortality of cancer treatment.[1,2]

CHOP regimen is often used for the treatment of Non-Hodgkin lymphoma. Puchitsathian J and Rojnuckarin P conducted a retrospective and prospective cohort study at King Chulalongkorn Memorial Hospital from 2006-2016. Their study observed febrile neutropenia in NHL patients after 1st cycle CHOP or R-CHOP regimens with G-CSF prophylaxis was given according to attending doctor discretions.

They reported the incidence of febrile neutropenia was 25% which lower than previous study in Intragumtornchai T, et al that was 30%.[3] Addition of Rituximab to CHOP regimen did not increase incidence of febrile neutropenia compared to CHOP alone. In this study, in spite of G-CSF prophylaxis, the incidence of febrile neutropenia after R-CHOP or CHOP regimens is still high, especially in the elderly with co-morbid diseases.

Indications for using myeloid growth factor for febrile neutropenia are patients who received chemotherapy regimens those the incidence of neutropenia more than 20% and for 10-20% considered G-CSF based on the patient risk factors.[4,6-7] Several risk factors are also shown increasing the risk and its complication. Age is a major risk with other factors as follows:

- Advanced disease
- History of prior febrile neutropenia

Table 1. Multinational Association for Supportive Care in Cancer (MASCC) score.[5]

Clinical parameters	Score*
Burden of illness: no or mild symptoms	5
No hypotension	5
No chronic obstructive pulmonary disease	4
Solid tumor or no previous fungal infection	4
No dehydration	3
Outpatient status	3
Burden of illness: moderate symptoms	3
Patient's age < 60 years	2

*The maximum score is 26; Scores > 21 indicate a low risk.

- No antibiotic or G-CSF prophylaxis
- Mucositis
- Poor performance status and/or cardiovascular disease

The guidelines (ESMO, ASCO and NCCN) also recommend the use of the Multinational Association for Supportive Care in Cancer (MASCC) index to identify patients at low risk of complications (Table 1) to be treated as outpatients. A patient who has a MASCC score > 21 points is considered "low risk" with positive and negative predictive values of 91% and 36%, respectively

In Thailand, risk of febrile neutropenia was also related to age, type of chemotherapy, bone marrow involvement of tumors, anemia, low serum albumin, presence of co-morbid disease, and history of febrile neutropenia.[8,9] The importance of assessing risk of febrile neutropenia in each patient will improve clinical outcomes of hematologic malignancy patients who needed chemotherapy.

References

1. *Freifeld AG, Bow EJ, Sepkowitz KA, Boeckh MJ, Ito JI, Mullen CA, et al. Clinical practice guideline for the use of antimicrobial agents in neutropenic patients with cancer: 2010 update by the Infectious Diseases Society of America. Clin Infect Dis 2011;52:427-31.*
2. *Villafuerte-Gutierrez P, Villalon L, Losa JE, Henriquez-Camacho C. Treatment of febrile neutropenia and prophylaxis in hematologic malignancies: A Critical Review and Update. Advances in Hematology 2014:9 pages. https://www.hindawi.com/journals/ah/2014/986938/ (accessed on February 12, 2017).*
3. *Intragumtornchai T, Sutheesophon J, Sutcharitchan P, Swasdikul D. A predictive model for life-threatening neutropenia and febrile neutropenia after the first course of CHOP chemotherapy in patients with aggressive non-Hodgkin's lymphoma. Leuk Lymphoma 2000;37:351-60.*
4. *ESMO 2016: Management of febrile neutropenia: ESMO clinical practice guidelines. Ann Oncol 2016:(suppl 5):v111-8.*
5. *Carmona B, Gómez J, González-Billalabeitia E, Canteras M, Navarrete A, Gonzálvez ML, et al. Prognostic evaluation of febrile neutropenia in apparently stable adult cancer patients. British Journal of Cancer 2011;105:612-7.*
6. *Flowers CR, Seidenfeld J, Bow EJ, Karten C, Gleason C, Hawley DK, et al. Antimicrobial prophylaxis and outpatient management of fever and neutropenia in adults treated for malignancy: American Society of Clinical Oncology clinical practice guideline. J Clin Oncol 2013;31:794-810.*
7. *National comprehensive cancer network (NCCN) Clinical practice guideline in oncology. Myeloid growth factors. Version 2. 2016. http://www.nccn.org (accessed on February 12, 2017).*
8. *Leelayuthachai T, Kanitsap N. Febrile neutropenia in post-chemotherapeutic patients in medicine department, Thammasat University Hospital. J Hematol Transfus Med 2010;20:197-203.*
9. *Teparat P, Kanitsap N. Potential risk factors of febrile neutropenia in cancer patients receiving chemotherapy. Tham Med J 2015;15:200-9.*