Predictive Factors For Severe Neutropenia Following The First Cycle Chemotherapy In Breast Cancer Patients

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Background: Neutropenia following chemotherapy administration may frequently lead to a life-threatening infection. Unanticipated episodes of neutropenia may occur following the first cycle chemotherapy. We sought to characterize predictive risk factors for severe neutropenia in breast cancer patients after the first cycle chemotherapy.

Method: We prospectively collected data of breast cancer patients who received treatment doxorubicin and cyclophosphamide (AC) regimen for any stage at the Oncology Unit during January-December 2011. Patients who received primary CSF prophylaxis were excluded. Correlations between patient's characteristics and the occurrences of severe neutropenia, febrile neutropenia (FN) were analyzed.

Results: Seventy-five breast cancer patients were included in this study. Median age was 50 years. All patients were in good performance status (PS 0-1). There were a few patients with co-morbidities including 1% with type 2 diabetes mellitus, and 19% with hypertension. 3 of 75 (4%) were metastatic breast cancers with lung, bone metastases. All patients received no chemotherapy or radiation prior to the study. The median body surface area was 1.58 m². All of the patients had normal baseline white blood cell count. After the first cycle AC, 24% and 60% of patients developed grade 3 and 4 neutropenia respectively and 13% of patients developed FN. Analyses for predictive factors showed no statistical significant correlation between grade 4 neutropenia and age over 59 years (OR 0.51, 95%CI 0.15-1.69), BSA less than 1.5 m² (OR 0.90, 95%CI 0.34-2.42), body mass index less than 18.5 kg/m² (OR 1.0, 95%CI 0.16-6.37), dietary protein index less than 0.8 g/kg/day (OR 0.51, 95%CI 0.20-1.33), or metastatic disease (OR 1.35, 95%CI 0.12-15.57).

Conclusion: Simple clinical factors cannot reliably predict the first cycle FN in breast cancer patients receiving AC chemotherapy. For development of future predictive model, the complex relation within data sets should be taken into account such as novel biomarkers or genetic profiles.