

Predicting Individual Risk of Neutropenic Complications in Patients Receiving Cancer Chemotherapy

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This study aimed to prospectively develop and validate a clinical risk model for the occurrence of severe (SN) or febrile neutropenia (FN). 4,458 patients were registered in this prospective cohort study; 521 with colorectal cancer, 907 with lung cancer, 312 with ovary cancer, 1,473 with breast cancer, 547 with lymphoma, and 698 with other cancers. The majority of patients (n=1,615) received alkylating agents, followed by anthracycline-based chemotherapy (n=1,469), and platinum-based chemotherapy (n=1,200). The study population (n=3,638) was randomly (2:1) divided into a derivation dataset (n=2,425) and a separate validation dataset (n=1,213). SN or FN during cycle 1 chemotherapy was reported in 472 (20%) of patients in the derivation dataset and in 257 (21%) of patients in the validation population. Predictive ability of the risk model in the derivation dataset was good; sensitivity was 90%, specificity was 59%, and area under the receiver operating characteristic (ROC) curve was 0.83. The risk model performed just as well in the validation dataset; sensitivity was 85%, specificity was 59%, and area under the ROC curve was 0.81. Diagnostic odds ratios (ORs, the ratio of the likelihood ratio positive to the likelihood ratio negative) were calculated as a measure of overall model discrimination (OR=12.81 in the derivation dataset and OR=8.03 in the validation dataset). After further validation of the model in independent practice settings, it may help to identify patients at increased risk of neutropenic complications and to target supportive care measures.

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