Improvement in prediction of blood clots in cancer patients

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For cancer patients, who have an increased risk of developing venous thromboembolism (VTE) due to a hyperactive blood coagulation system, there is now an enhanced risk model to predict their chance of developing blood clots, according to a recent study published today in *Blood*, the journal of the American Society of Hematology.

VTE, the formation of blood clots in the veins, develops in up to 20 percent of cancer patients and is one of the leading causes of death among this patient population. Patients with hematologic malignancies (blood cancers), particularly those with lymphoma and multiple myeloma, have relatively high rates of VTE—results from this study found that 7.2 percent of lymphoma patients and 7.4 percent of the total study population developed VTE, compared to an estimated general population incidence rate of .001 percent.

"Because the risk of VTE is not equal in all cancer patients and anticoagulation in cancer patients results in a higher risk of bleeding complications, categorizing cancer patients according to their VTE risk is important," said Ingrid Pabinger, MD, professor at the Medical University of Vienna and lead author of the study. Patients with high risk of VTE may benefit from routine thrombophrophylaxis, preventive treatment for blood clotting, while low-risk patients tend to have a higher bleeding risk and may not be the best candidates for routine anticoagulation treatments.

Although there is a current risk prediction model for VTE in cancer

patients, which includes factors such as site of cancer, body mass index, platelet and leukocyte counts, and hemoglobin level—all known to increase the risk of cancer-associated VTE—the new model also incorporates two new biomarkers, soluble P-selectin (sP-selectin) and D-dimer, to further stratify patients into high- and low-risk groups. sP-selectin is a cell adhesion molecule that promotes blood clot formation and D-dimer is a protein found in the blood that is used to detect abnormal blood clot formation and breakdown. Both have been previously identified as predictive biomarkers for cancer-associated VTE and their addition into the risk prediction model improves the accuracy of the classification of the patients into different risk categories. According to this new risk scoring model, about one-third (35 percent) of cancer patients in the highest risk category developed VTE during the study, as opposed to only one percent of patients in the lowest risk category.

In this study, researchers examined 819 cancer patients enrolled in the Vienna Cancer and Thrombosis Study (CATS), an ongoing prospective observational study performed at the Medical University of Vienna, between October 2003 and December 2008. Cancer types included: brain, breast, lung, stomach, colorectal, pancreatic, kidney, prostate, and hematologic malignancies such as myeloma and lymphoma.

"Our expanded model demonstrates that cancer patients at a very high risk of VTE can be defined more precisely," said Cihan Ay, MD, hematology fellow at the Clinical Division of Hematology and Hemostaseology at the Medical University of Vienna and co-author of the study. "This new model can help clinicians tailor their anticoagulant therapy and improve blood clotting prevention, which will maximize the clinical benefit and cost-effectiveness of disease prevention and minimize the risk of bleeding complications."

Provided by American Society of Hematology