Genetic testing could help ID breast cancer pts at high risk of venous thromboembolism

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Genetic testing could help identify breast cancer patients with high risk of experiencing venous thromboembolism (VTE), a serious and potentially fatal complication that can occur during cancer treatment.

The study was published in *Clinical Cancer Research*, a journal of the American Association for Cancer Research.

"The risk for venous thromboembolism (the formation of blood clots in a vein) is increased in cancer patients, particularly in those receiving chemotherapy," Judith S. Brand, PhD, a postdoctoral researcher in the Department of Medical Epidemiology and Biostatistics at Karolinska Institutet in Stockholm, Sweden, said. "As one of the most common cancers, breast cancer accounts for a large number of cancer-associated VTE cases." VTE is preventable through thromboprophylaxis with low molecular weight heparin, an anticoagulant drug. However, this regimen is not routinely recommended in patients undergoing chemotherapy due to side effects such as bleeding.

How the Study Was Conducted and Results: Brand and colleagues sought to identify the individual and joint effects of chemotherapy and genetic susceptibility on VTE risk. The study included 4,261 women in the Stockholm region diagnosed with primary invasive breast cancer between 2001 and 2008, and followed until 2012. Risks were stratified based on chemotherapy status and genetic susceptibility, as determined by a polygenic risk score (PRS) based on nine genetic variants (including the factor V Leiden mutation), with the top 5 percent classified as

having high genetic susceptibility.

The study found that the one-year cumulative incidence of VTE was 9.5 percent in the breast cancer patients who both received chemotherapy and had high genetic susceptibility, compared with 1.3 percent in the patients who did not receive chemotherapy and had lower genetic susceptibility.

The study discovered that chemotherapy and genetic susceptibility independently increased the risk of VTE and that the impact of genetic susceptibility was most pronounced in older patients: In patients aged 60 or older who underwent chemotherapy and had a high genetic susceptibility, the 1-year cumulative incidence of VTE was 25 percent.

"Breast cancer patients receiving chemotherapy are not routinely being examined for VTE prevention in today's clinical practice. Our study demonstrates that information on genetic susceptibility can be used to identify patients at high risk of developing VTE," Brand said.

"Combined with other clinical risk factors and biomarkers, these findings will guide future studies evaluating routine VTE risk assessment in chemotherapy outpatients, and prophylaxis for those at highest risk. Because older patients demonstrated a stronger genetic effect and higher VTE incidence, this group requires special attention in future risk stratification efforts," she added.

Brand said a limitation of the study is the small number of older patients who had chemotherapy and a high genetic susceptibility. She said larger-scale studies would be necessary to provide more precise risk estimates. Brand added that further research is needed to assess the safety and potential benefit of thromboprophylaxis in high-risk cancer patients.