Can Our Genes Predict Dangerous Blood Clots Returning?

Blood clots in the veins, known as venous thromboembolism (VTE), can become life-threatening. Patients are treated with blood-thinning medication to prevent new clots, but the treatment itself increases the risk of bleeding. One of the biggest challenges for doctors is predicting which patients need longer treatment to spot the clots from returning. This study investigates whether genetic differences can help explain why some patients experience recurrent VTE.

Nearly half of all blood clot cases occur without a clear cause, suggesting that genetics may play an important role. Scientists believe that small changes in DNA, known as genetic mutations, can affect how certain proteins function in the body. Some of these proteins help control blood clotting, while others influence inflammation and blood flow. When these systems do not work properly, the risk of developing dangerous clots may increase.

In this project, ten genetic variants linked to proteins involved in blood clotting were investigated. Some of these proteins directly help the body stop bleeding after an injury, while others influence processes connected to clot formation indirectly. By analyzing DNA samples from patients with VTE, the study explored whether these genetic differences were associated with a higher risk of developing new blood clots after the treatment.

The study included DNA samples from more than 1.300 Swedish patients participating in the Malmö Thrombophilia Study. No clear connection was shown to recurrent VTE, after analyzing most of the genetic variants. However two genetic variants did show a significant association.

One variant was linked to a higher risk of recurrence in patients whose first clot had been triggered by factors such as surgery or immobilization. Another variant showed a string association with recurrent VTE in patients whose blood clots occurred without a clear cause.

These findings suggest that genetics may help explain why some patients develop blood clots repeatedly, even after treatment. In the future, genetic screening could support doctors in deciding which patients may benefit from longer anticoagulant and closer follow-up care.