Editorial

The testing of inherited thrombophilia in Thai patients with thromboembolism

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Inherited thrombophilia is a hypercoagulable state associated with an increased risk of arterial or venous thromboembolism.[1] Gene mutations commonly found include *PROC, PROS, SERPINC1, F2G20210A* (the prothrombin gene mutation) and *F5G1691A /FVR560Q* (factor V Leiden).[2,3] While the prevalence of factor V Leiden is relatively common among Caucasians, affecting approximately 3-8% in the United States and European populations,[4] it is extremely low among Asians.[5]

A large population-based study conducted in 5,234 Thai individuals demonstrated that natural anticoagulant deficiencies are more common in Thais compared to Caucasians.[6] In addition, hereditary protein C deficiency, particularly the p.R189W mutation, is common among Thais.[6]

Antithrombin, a plasma serine protease inhibitor, primarily inhibits serine protease coagulation factors.[7] Antithrombin deficiency is generally defined as plasma anticoagulant activity that is lower than the normal range.[8] The prevalence of congenital antithrombin deficiency was 0.02-0.2% in the general population.[8] However, antithrombin deficiency has been identified as a prothrombotic risk factor for venous thromboembolism in 2-7% of Asian patients.[9]

To date, more than 350 mutations have been identified in the *SERPINC1* gene, resulting in inherited antithrombin deficiency.[10] Type I and type II refer to quantitative and qualitative antithrombin deficiencies, respectively.[11]

In this issue, Idris et al. performed genetic testing on Thai patients who presented with arterial or venous thrombosis along with low antithrombin activity levels. After excluding those with possible acquired antithrombin deficiency, *SERPINC1* gene mutational analysis was conducted using Sanger sequencing for all participants, including 6 healthy participants (control), who had normal antithrombin levels and no history of thrombosis. This study revealed that one (6.7%) of the patients had a likely pathogenic mutation, specifically a novel mutation *SERPINC1* p.Y190X in exon 3. However, no identifiable causes for low antithrombin levels were found in the rest of the participants.

Current clinical practice guidelines do not recommend routine investigation for thrombophilia due to its low clinical utility.[12] In addition, the timing of testing is crucial to avoid falsely low antithrombin levels during acute venous thrombosis. Ideally, antithrombin levels should be tested 3 months after the onset of venous thrombosis.[12] In patients with low antithrombin levels, possible causes of acquired antithrombin deficiency, such as sepsis, pregnancy, surgery, etc., should be investigated.[7]

There are limited data on the true prevalence of antithrombin deficiency in the Thai population, particularly in patients with thromboembolic diseases. Furthermore, studies investigating gene mutations in patients with inherited antithrombin deficiency need to be conducted.

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