

THROMBOSIS

Selective D-dimer testing improves efficiency of DVT diagnosis

Investigators from Canada have shown, for the first time, that selective D-dimer testing is as safe as, and more efficient than, universal testing in patients with a suspected first episode of deep-vein thrombosis (DVT). “Our research group has been evaluating the use of D-dimer assays for the diagnosis of venous thromboembolism for over a decade,” says lead author Lori-Ann Linkins, who observed that “a large proportion of patients with a low clinical suspicion of venous thromboembolism had a false-positive result when the standard one-size-fits-all D-dimer threshold is used.”

D-dimer is a fibrin degradation product indicative of thrombotic activity such as DVT and pulmonary embolism. However, D-dimer can also be present in the blood of patients with nonthrombotic conditions and those who have undergone surgery. Although sensitive, therefore, the D-dimer test is not specific for DVT, and strategies to improve diagnosis are needed. Linkins *et al.* explored the hypothesis that D-dimer testing could be safely omitted in outpatients with a high clinical pretest probability (C-PTP) of DVT (among whom the prevalence of DVT is usually high) and hospital inpatients (who commonly have an elevated D-dimer level as a result of comorbidities). They also investigated whether the use of a high D-dimer threshold (<1.0 µg/ml rather than 0.5 µg/ml) for patients with a low C-PTP could reduce the requirement for ultrasonography.

In the SELECT trial, patients with a suspected first occurrence of acute symptomatic DVT were enrolled consecutively, and randomly assigned to the experimental ($n=860$) or control ($n=863$) groups. All patients were assessed using the 9-point Wells clinical prediction rule, and classified as having a low, moderate, or high C-PTP of DVT. In the control group, all patients underwent D-dimer testing. Patients with a positive result (≥ 0.5 µg/ml) underwent ultrasonography and those with a negative result (< 0.5 µg/ml) received no additional testing. In the experimental group, only outpatients with low or moderate C-PTP had a D-dimer test. The threshold for a positive test result was < 1.0 µg/ml in the low C-PTP cohort, and < 0.5 µg/ml for patients with a moderate C-PTP. As with the control strategy, a positive test warranted ultrasonography, but individuals with a negative result had no further testing. Hospital inpatients and individuals with a high C-PTP were referred for immediate ultrasonography without D-dimer testing.

During the 3-month follow-up period, the rate of venous thromboembolism was 0.5% in both groups. In the control group, 56 patients (11.1%) had both a positive D-dimer test and were diagnosed with DVT on ultrasonography. None of the control patients with a negative test were diagnosed with DVT. In the experimental group, the D-dimer test was negative in 80% and 43% of those with a low or moderate



© Egortetiushev Dreamstime.com

C-PTP, respectively. None of the patients with low C-PTP and negative D-dimer test later developed venous thromboembolism, and this condition occurred during follow-up in only one patient with a moderate C-PTP and negative test. This selective strategy improved the efficiency of diagnosis—21.8% fewer patients had a D-dimer test, and 7.6% fewer required ultrasonography compared with standard testing, without an unacceptable number of false-negative results.

“We have already started applying the results from the SELECT study to patients who present with suspected first acute DVT in our practice,” concludes Dr Linkins. “In future, we plan to test our approach in patients with suspected recurrent DVT and suspected pulmonary embolism.”

Alexandra King

Original article Linkins, L.-A. *et al.* Selective D-dimer testing for diagnosis of first suspected episode of deep venous thrombosis: a randomized trial. *Ann. Intern. Med.* 158, 93–100 (2013)