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Impact of D-Dimer in Pulmonary Embolism Diagnosis

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Commentary

Rather than relying on a single test, the diagnosis of pulmonary embolism (PE) is now based on the sequential application of many diagnostic techniques. These diagnostic procedures have been prospectively validated and are safe. After identifying patients with a PE suspicion, the first step is to determine the pre-test clinical probability. Several ratings are available for making a standardised and repeatable assessment of clinical probability, and hence serve as valuable diagnostic tools. Clinical likelihood does, in fact, drive additional research. Indeed, in around a third of outpatients with a low or moderate clinical likelihood, or a "unlikely" probability, PE may be confidently ruled out by negative D-dimers without further imaging. CT pulmonary angiography is currently the preferred imaging method in cases of positive D-dimers and a high clinical likelihood or a "probable" clinical probability. Patients with contraindications to CT, such as those with renal insufficiency, can nevertheless benefit from lower limb venous compression ultrasonography and ventilation/perfusion studies. Finally, new diagnostic tests appear to be promising. V/Q SPECT, for example, has emerged as a highly accurate test and a potential replacement for CTPA. Prospective management outcome studies, on the other hand, are still few.

The measurement of D-dimer can help in the diagnosis of patients who have a suspicion of venous thromboembolism. The use of D-dimer testing in combination with an accurate assessment of pretest likelihood can help patients with suspected pulmonary embolism be safely discharged and avoid needless inquiry or anticoagulationclinical decision-making techniques in the diagnosis of pulmonary embolism, as well as methods to reduce diagnostic mistake caused by knowing the D-dimer value before clinical evaluation. Patients who had a suspected deep-vein thrombosis in the lower limb were possibly eligible. Physicians examined the patients and classified them as probable or unlikely to develop deep-vein thrombosis using a clinical model. The patients were then assigned to either ultrasound imaging alone (control group) or D-dimer testing followed by ultrasound imaging (D-dimer group), unless the D-dimer test was negative and the patient was clinically unlikely to have deep-vein thrombosis, in which case ultrasound imaging was skipped.

A safe diagnostic method should be based on a post-test incidence of venous thromboembolism (VTE) of less than 1%, with a negative predictive value of more than 99 to 100 percent over the 3-month follow-up period. Deep venous thrombosis (DVT) and pulmonary embolism (PE) are presently confirmed or ruled out using compression ultrasonography (CUS) and spiral computed tomography (CT), respectively. CUS has a negative predictive value (NPV) of 97 to 98 percent, indicating that clinical score evaluation and D-dimer tests should be used to improve the diagnostic work-up of patients with suspected DVT. As a stand-alone technique, spiral CT identifies all clinically significant PEs as well as a wide range of alternative diagnoses. With an NPV of 98 to 99 percent, PE is ruled out. Because spiral CT is costly, clinical score evaluation and D-dimer tests should be used to improve the diagnostic work-up of individuals with suspected PE.

In multicenter trials and in everyday practise, clinical score evaluation for DVT and PE has not reliably ruled out VTE. Eliminating the "minus 2 points" for alternate diagnosis from the Wells clinical score evaluation for DVT will enhance the clinical score assessment's repeatability. In about 60 to 70% of patients, a combination of a first negative CUS and a negative SimpliRed or an enzyme-linked immunosorbent assay (ELISA) VIDAS D-dimer of 1,000 ng/mL securely excludes DVT (NPV > 99%) regardless of clinical score evaluation and without the need to repeat CUS (NPV > 99%). The fast quantitative and qualitative agglutination D-dimer assays for excluding VTE are insufficiently sensitive as stand-alone tests and should be performed in conjunction with clinical score evaluation. Without the use of CUS or spiral CT, a normal fast ELISA VIDAS D-dimer test as a stand-alone test securely eliminates DVT and PE with an NPV of 99 to 100 percent, independent of clinical score. The use of a fast ELISA VIDAS D-dimer followed by objective testing with CUS for DVT and spiral CT for PE will cut the requirement for noninvasive imaging by 40 to 50%. Studies employing enzyme-linked immunosorbent assays (ELISA) to measure the fibrin degradation product D-Dimer (DD) in patients suspected of deep vein thrombosis (DVT) or pulmonary embolism (PE) show that if the DD level is below a specific cut-off value, DVT/PE can be ruled out. ELISA techniques, on the other hand, are time-consuming, expensive, and only accessible in specialised laboratories. As a result, numerous faster and less expensive DD tests have recently been developed.

The current study on fast latex and ELISA DD tests in the diagnosis of DVT and PE is reviewed in this article. Two novel latex tests appear to be suitable for clinical use. The SimpliRed DD, an autologous red cell agglutination test that may be conducted on fresh whole blood, is the most widely researched assay. DVT has been reported to have a sensitivity (Sens) and a negative predictive value (NPV) of 89-100 percent and 95-100 percent, respectively, whereas PE has been reported to have a sensitivity (Sens) and a negative predictive value (NPV) of 94-100 percent and 98-100 percent, respectively. Tinaquant, the second test, is a quantitative latex assay. In one study, sensitivity and negative predictive value (NPV) for DVT were found to be 99 percent and 93 percent, respectively. Clinical outcome studies have demonstrated that withholding anticoagulant treatment in patients with suspected pulmonary embolism (PE) and a low pretest probability (PTP) using either a PTP model or clinical gestalt is safe in patients with a negative D-dimer result and a low pretest probability (PTP). The goal of this study was to see how safe it was to use the Wells or Geneva models to rule out PE when a negative VIDAS D-dimer test was combined with a non-high PTP.

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