

Newsletter

D – dimer

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What is Fibrin D-dimer?

D dimer has been in use for almost three decades, as a screening tool for Venous thromboembolism (VTE)¹. It is one of many Fibrin degradation products (FDP) produced after a clot is degraded by the process of fibrinolysis. FDPs come in a variety of molecular weights. However, unlike other FDPs that are formed following degradation of fibrinogen and fibrin, D – dimer is produced exclusively from cross-linked fibrin. D dimer is therefore indicative of clot degradation and not non-specific fibrinolysis².

Utility

Only a small amount of cross-linked Fibrin is required to generate D-dimer, making it a sensitive marker for VTE³. It is therefore a good screening test in individuals at risk of VTE or in individuals with clinical presentation suggestive of the VTE³. D dimer should never be used as a standalone test but in conjunction with Clinical pre-test probability and definitive imaging to make the diagnosis of VTE.

In individuals with low clinical pre-test probability assessment, D dimer has high negative predictive value for VTE making it an excellent rule-out test^{4,5}.

In contrast, a high D-dimer level, is non-specific to VTE and clinical pretest probability is required to determine the significance of a positive result^{4,5}. D dimer values also rise with age and higher cut

offs have been proposed for older individuals, though these have yet to be established⁵. A positive D dimer test is therefore not diagnostic of VTE but indicates the need for further evaluation. In patients in with a high pre-test probability, a normal D-dimer level does not exclude VTE, and definitive imaging is indicated⁴.

To establish Clinical pre-test probability, clinical assessment may be supplemented / standardized by validated scoring systems⁴. These scoring systems include Wells, Modified Wells Modified Geneva, and PERC (Pulmonary embolism rule out criteria)^{4,5}. Wells scoring system is the most widely used, however selection of which scoring system to use is based on In-hospital protocols.

Causes of high D dimer

Thromboembolism

- Arterial such as Myocardial infarction, Stroke, Acute limb ischemia etc
- Venous such as Deep venous thrombosis, Pulmonary embolism
- Disseminated intravascular coagulation (DIC)

Inflammation

- Infections such as COVID-19
- Sepsis

Surgery and trauma

Liver disease

Kidney disease

Vascular disease

- Vaso-occlusive Sickle cell crisis
- Vascular malformations

Malignancy

Thrombolytic therapy

Pregnancy

- Physiological changes
- Preeclampsia and Eclampsia

Clinical indications for D-dimer test⁴:

- Deep venous thrombosis
- Pulmonary thromboembolism
- Primary hyperfibrinolysis
- Disseminated intravascular hemolysis
- Prognostic assessment if COVID-19

Reference range

The reference range for D dimer is < 500 ng/mL or 0.5 ug/ml

Sample type

Heparin whole blood

References

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