South West Strategic Clinical Network
Somerset, Wiltshire, Avon and Gloucestershire (SWAG) Cancer Services

D-Dimers

Background

D-dimers are degradation products of cross-linked fibrin. They are released when the fibrinolytic system attacks the fibrin matrix of fresh venous thromboemboli (VTE), as seen in deep vein thrombosis (DVT), pulmonary emboli (PE) and disseminated intravascular coagulation (DIC). D-dimers are clinically useful in risk stratifying patients with a suspected VTE.

When to check D-Dimers

D-dimer testing is indicated in some, but not all, patients with a suspected VTE.

The Wells score (Appendix 1 & 2) should employed in all patients with a suspected VTE. If a patient has a high Wells score there is **no benefit** in checking the D-dimer level. In these cases radiological testing needs to be carried out to exclude VTE. In patients with a moderate or low Wells score, a D-dimer **may be helpful** in excluding the diagnosis of VTE.

Interpreting a normal D-Dimer result

A normal D-dimer result implies that there is no fresh thromboembolic material undergoing dissolution in the deep veins or in the pulmonary arterial tree. This is useful for ruling out pulmonary embolism (PE) in patients with a low pre-test probability of PE (Well's score <5) or a non-diagnostic V/Q scan. Similarly, a low pre-test probability of DVT (Wells score <2) excludes a DVT.

Therefore, a D-dimer below 500mcg/l rules out VTE with a high predictive value, in patients with a low or moderate clinical probability of VTE, as defined by the Wells score. No further investigation is needed.

Interpreting a raised D-Dimer result

There are many conditions, excluding VTE, which may result in a raised D-dimer. Some common examples are listed below. Greater than 80% of patients admitted with these conditions will have a baseline D-dimer above the normal range.

- disseminated intravascular coagulation
- postoperatively/trauma
- infection/inflammation
- liver disease
- heart disease (MI, AF, unstable angina)
- active cancer
- acute CVA

- phlebitis/vasculitis

Other factors may affect the affect D-dimer levels, such as those listed below.

- levels increase with age, pregnancy, and smoking
- levels may not increase if a patient has an acute VTE but impaired fibrinolysis
- heparin reduces levels. Similarly two-thirds in patients on oral anticoagulants may have lower levels
- the time between the onset of an acute VTE and sample collection may affect the result. Levels may normalise when a VTE has been present for >7 days.

Therefore, if the D-dimer is raised **and** the patient does not have another cause for a raised D-dimer **and** a VTE is suspected, radiological testing is required to exclude a VTE.

References:

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Appendix 1 - DVT Wells score

Clinical feature	**Points**	**Patient score**
Active cancer (treatment ongoing, within 6 months, or palliative)	1	
Paralysis, paresis or recent plaster immobilisation of the lower extremities	1	
Recently bedridden for 3 days or more or major surgery within 12 weeks requiring general or regional anaesthesia	1	
Localised tenderness along the distribution of the deep venous system	1	
Entire leg swollen	1	
Calf swelling at least 3 cm larger than asymptomatic side	1	
Pitting oedema confined to the symptomatic leg	1	
Collateral superficial veins (non-varicose)	1	
Previously documented DVT	1	
An alternative diagnosis is at least as likely as DVT	−2	
Clinical probability simplified score		
DVT *likely*	More than 1 point	
DVT *unlikely*	1 point or less	

Appendix 2 - PE Wells score

Clinical feature	**Points**	**Patient score**
Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)	3	
An alternative diagnosis is less likely than PE	3	
Heart rate > 100 beats per minute	1.5	
Immobilisation for more than 3 days or surgery in the previous 4 weeks	1.5	
Previous DVT/PE	1.5	
Haemoptysis	1	
Malignancy (on treatment, treated in the last 6 months, or palliative)	1	
Clinical probability simplified scores		
PE *likely*	More than 4 points	
PE *unlikely*	4 points or less	