Screening test for thrombophilia

Thrombophilia can be defined as a predisposition to form clots inappropriately. Thrombotic events are increasingly recognized as a significant source of mortality and morbidity. The predisposition to form clots can arise from genetic factors, acquired changes in the clotting mechanism, or, more commonly, an interaction between genetic and acquired factors.

Lupus anticoagulant (LA)

There is one acquired abnormality which is associated with an increased risk of venous thrombosis. That is the lupus anticoagulant, and is an anti-phospholipid antibody.Lupus anticoagulant (LA) results in prolongation of coagulation tests dependent on phospholipid. It is associated with a range of autoimmune disorders, infections and treatment with some drugs. Always the pathological outcome confirmed in 12 weeks.

Beta-2 Glycoprotein 1 Antibodies

Beta-2 glycoprotein 1 antibody tests are used along with cardiolipin antibody and lupus anticoagulant testing to help diagnose the cause of an unexplained blood clot (thrombotic episode) or recurrent miscarriages, to help diagnose antiphospholipid syndrome (APS), or to detect the autoantibodies in someone with another autoimmune disorder. Antiphospholipid antibodies, including beta-2 glycoprotein antibodies, are associated with excessive clotting. Laboratory tests can detect three different classes of these autoantibodies: IgG, IgM, and IgA. Always the pathological outcome confirmed in 12 weeks.

Cardiolipin Antibodies

Anticardiolipin Antibodies (aCL Antibody) or Cardiolipin Antibodies help to investigate inappropriate blood clot formation, to help determine the cause of recurrent miscarriage, or as part of an evaluation for antiphospholipid syndrome or

sometimes other autoimmune diseases. Always the pathological outcome confirmed in 12 weeks.

Antibodies to serine, phosphatidic acid, ethanolamine, etc.

Also belong to Antiphospholipid antibodies. It is measured in the absence of anticoagulant. The absence or presence of a kind of antiphospholipid antibodies does not imply the absence or presence of the residues. . Always the pathological outcome confirmed in 12 weeks.

Antithrombin

Antithrombin (AT) is a major inhibitor of blood coagulation and is essential for effective heparin therapy. AT inhibits the coagulation proteases including II a, X a , IX a and XI a. AT deficiency is associated with a high risk of thrombotic disorders.

Free Protein S

Protein S is a vitamin K dependent cofactor for the anticoagulant activity of activated protein C (APC). It has been associated with a high risk of developing venous thromboembolism especially in young people. As only the free form of Protein S has the cofactor activity it is only this form that is measured.

Protein C.

Protein C is part of the anticoagulant regulatory mechanism. It is converted to activate protein C (APC) by thrombin in the presence of thrombomodulin. APC inactivates activated factors V and VIII. Protein C deficiency has been shown to be a risk factor for thrombosis.

APC Resistance Assay

Protein C is a naturally occurring inhibitor of blood coagulation, acting on activated factor V and VIII. The condition whereby a patient's plasma does not produce the appropriate anticoagulant response to activated protein C (APC) is termed APC resistance. This is caused by the VQ506 gene mutation which produces factor V Leiden, a factor V molecule which is resistant to cleavage by activated protein C.

Factor V Leiden mutation

The identification of Factor V Leiden mutation is carried out using PCR technology. This method is used to identify the genotype of the abnormality. PCR testing is carried out on all samples that have a reduced APCR or have a family history of factor V Leiden.

Prothrombin gene mutation (G-20210-A)

The mutation in the factor II gene (G-20210-A) is in the untranslated portion at start of the gene and is probably part of the regulatory system for the gene. People carrying the mutation have higher levels of factor II than normal and the increased risk of thrombosis is thought to be a function of this.

Factor VII

There are several studies that demonstrate that deficiency of factor VII can cause significant increase in bleeding risk among affected individuals. There is also some evidence that elevated Factor VII is related to an increased risk of thrombosis.

Elevated Factor IX

Factor IX is a circulating serine protease that serves as an essential component of the blood coagulation pathway, and has been shown to increase with age in humans. It

is measured in the absence of anticoagulant. Medications or conditions may affect the measurement

Elevated Factor XI

A component of the intrinsic pathway of coagulation, contributes to the generation of thrombin, which is involved in both the formation of fibrin and protection against fibrinolysis. It is measured in the absence of anticoagulant. Medications or conditions may affect the measurement

Factor XII deficiency

Factor XII or Hageman factor is the zymogen of a serine protease that initiates the contact activation reactions and intrinsic blood coagulation in vitro. Severe factor XII deficiency is inherited as an autosomal recessive trait.

Elevated Factor VIII

Elevated plasma factor VIII coagulant activity (VIII:C) is now accepted as an independent marker of increased thrombotic risk. It has been associated with arterial and venous thrombosis as well as their relapses. It is measured in the absence of anticoagulant. Medications or conditions may affect the measurement

Homocysteine levels.

Increased levels of homocysteine in the blood increase the risk of arterial and venous thrombosis due to vascular damage. Mutations in the MTHFR gene - an enzyme that converts homocysteine - (677C / T and 1298A / C) predispose its appearance. The diagnosis is made by counting blood levels. Elevations in the plasma homocysteine concentration can occur due to genetic defects in the enzymes involved in homocysteine metabolism as well as due to nutritional deficiencies in vitamin cofactors, or to other factors including some chronic medical conditions and drugs

The most common form of genetic hyperhomocysteinemia results from production of a thermolabile variant of methylene tetrahydrofolate reductase (MTHFR) with reduced enzymatic activity (T mutation). The gene encoding for this variant contains an alanine-to-valine substitution at amino acid 677 (C677T)

Polymorphisms in the FXIII gene

The presence of FXIIVal34Leu polymorphism leads to faster activation of factor IXIII and gives moderate protection in the incidence of myocardial infarction, while its role in other conditions has not been demonstrated. The diagnosis is made by detecting the responsible polymorphism with PCR reaction. It is not affected by drugs or other conditions.

Platelet glycoprotein gene polymorphisms

Being a critical element of the clot forming process, platelets and platelet glycoprotein gene polymorphisms have received increasing attention as possible inherited determinants of prothrombotic tendency. However, their role in genetic susceptibility to thrombotic disease remains controversial. Platelet collagen receptor (glycoprotein Ia/IIa; integrin alpha2 beta1) polymorphisms have also been implicated in thrombotic disease. More studies need to be done to establish a relationship between the risk of thrombotic events and platelet glycoprotein gene polymorphisms.

D-Dimers

A positive D-dimer indicates the presence of an abnormally high level of cross-linked fibrin degradation products in your body. It means there has been significant clot (thrombus) formation and breakdown in the body, but it does not identify the location or cause. An elevated D-dimer may be due to a VTE or DIC but it may also be

due to a recent surgery, or trauma, infection, liver or kidney disease, cancers, in normal pregnancy but also some diseases of pregnancy such as eclampsia.

Other examinations

Anti-Xa tests

This test measures the effect of low molecular weight heparin (LMWH) or unfractionated heparin (UFH) in the blood by measuring anti-Xa activity. Heparin is an anticoagulant, a drug that inhibits blood clotting. Both UFH and LMWH are given intravenously (I.V.) or through a subcutaneous injection to people who have inappropriate blood clots (thrombi) and/or are at an increased risk of developing them. Heparin can also inhibit blood clot formation in diseased arteries, which sometimes cause heart attacks or strokes.