TEST

Factor XII assay

A blood test that measures how well clotting factor XII works.

WHAT IT MEASURES
How well clotting factor XII works in plasma

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
About 5 to 10 minutes

RESULTS IN
Usually several days; laboratory turnaround differs

USED FOR
Diagnosing factor XII deficiency

MAIN LIMITATION
Anticoagulants and lupus anticoagulants can falsely lower activity

Overview

A factor XII assay is a blood test that measures the activity of factor XII, a protein involved in laboratory clotting reactions. It is also called a contact factor because it becomes active when blood meets certain surfaces.

The test usually measures how well factor XII works rather than how much protein is present. A less common antigen test can measure the amount.

Factor XII deficiency can make the activated partial thromboplastin time, or aPTT, much longer than expected. Despite this result, inherited factor XII deficiency usually does not cause abnormal bleeding. The assay helps explain an unusual laboratory result but does not measure your overall risk of bleeding or clotting.

Why the test is ordered

The most common reason for ordering this assay is an unexplained prolonged aPTT. This test measures how long plasma, the liquid part of blood, takes to clot under controlled conditions.

A prolonged aPTT may be found before an operation, during an investigation of bleeding, or as part of another assessment. Many conditions and medicines can prolong it, so a factor XII assay is only one part of the investigation.

The test may also be ordered:

Factor XII testing is not a routine screening test.

- After a mixing study suggests that a clotting factor is missing
- When a relative has confirmed factor XII deficiency
- To distinguish it from deficiencies of factors VIII, IX, or XI
- To investigate repeatedly prolonged aPTT results

Who should have the test

You may be offered the test if repeated aPTT results remain prolonged after common explanations, such as anticoagulant treatment or sample problems, have been considered.

Testing may also be useful if you have a family history of factor XII deficiency. Because this deficiency generally does not cause unusual bleeding, a personal bleeding history may point to another condition that requires separate testing.

The assay is not usually needed solely because you bruise easily. Bruising and bleeding can result from medicines, platelet disorders, blood vessel conditions, or deficiencies of other clotting factors.

How to prepare

You do not normally need to fast. You can usually eat, drink water, and take your usual medicines unless you have different instructions for other tests collected at the same time.

Tell the healthcare professional about all medicines and supplements you take, especially heparin, warfarin, apixaban, dabigatran, edoxaban, or rivaroxaban. These can interfere with clot-based testing.

Do not stop an anticoagulant like warfarin or apixaban on your own. The sample may need to be timed around treatment, or additional testing may be needed.

Also mention a recent blood or plasma transfusion, pregnancy, liver or kidney disease, or a recent serious illness because these can affect interpretation.

What happens during the test

A healthcare professional inserts a needle into a vein, usually in your arm, and collects blood into a tube containing citrate, which temporarily prevents clotting.

The appointment usually takes 5 to 10 minutes, and the blood draw itself often takes less than a minute.

In the laboratory, your plasma is commonly mixed with plasma known to lack factor XII. Reagents are added, and the clotting time is compared with calibrated plasma to estimate factor XII activity.

Understanding your results

Results are usually reported as a percentage of expected activity or in laboratory-specific units. Reference ranges vary, and interpretation may depend on medicines, pregnancy, recent transfusion, and your clinical situation.

Low activity may support factor XII deficiency. Very low activity can explain a substantially prolonged aPTT even without unusual bleeding.

A borderline or mildly low result does not always indicate an inherited deficiency. Anticoagulants, lupus anticoagulants, other factor deficiencies, illness, or sample problems can produce an apparently low result.

A result within the laboratory's range makes major factor XII deficiency less likely but does not rule out every cause of a prolonged aPTT. Higher activity is generally not diagnostically useful. The assay cannot by itself predict bleeding, blood clots, or future health problems.

What affects the results

Heparin and direct oral anticoagulants can delay clotting in the test tube. Warfarin mainly affects other factors but may also complicate interpretation.

A lupus anticoagulant is an antibody that interferes with certain clotting tests. Despite its name, it is not an anticoagulant medicine and does not usually cause bleeding. It can prolong the aPTT and make factor activity appear low.

A recent plasma transfusion may temporarily raise factor XII activity and hide a deficiency.

Collection and handling also matter. An underfilled citrate tube, a very high red blood cell concentration, a clotted sample, heparin contamination from an intravenous line, or delayed

processing can make results unreliable.

Factor XII levels may vary with age and change during pregnancy or estrogen treatment. Liver disease, severe illness, or protein loss through the kidneys may alter actual factor levels. Routine meals, coffee, time of day, and ordinary activity are not major influences.

Accuracy and limitations

A clot-based factor XII assay is generally effective at identifying substantial deficiency. Severe deficiency usually causes very low activity and a clearly prolonged aPTT.

However, anticoagulants, lupus anticoagulants, inhibitors, and other factor deficiencies can falsely lower results. Laboratories may repeat the assay at different sample dilutions or use additional methods when interference is suspected.

Borderline results are less certain because biological variation and differences between laboratory methods can shift a result across the reference limit. Repeating the test may be more useful than relying on one borderline value.

Recent plasma replacement can make activity appear normal. Testing may be repeated after transfused factors have cleared. An antigen assay can show whether too little factor XII protein is present, while genetic testing may be considered in selected cases.

Most importantly, factor XII activity does not reliably predict bleeding and should not be used alone to estimate surgical bleeding or blood-clot risk.

Risks and complications

The risks are those of an ordinary blood draw. You may have brief discomfort, a small bruise, or feel light-headed. Serious complications are uncommon.

What happens next

A low result is considered alongside your aPTT, medical history, medicines, and previous results. If interference is possible, testing may be repeated or timed differently in relation to anticoagulant treatment.

Additional tests may include a mixing study, lupus anticoagulant testing, or assays for factors VIII, IX, and XI. Some laboratories also assess other contact proteins that can prolong the aPTT without causing a typical bleeding disorder.

An isolated inherited factor XII deficiency usually requires documentation rather than treatment. Keeping a record can prevent future prolonged aPTT results from causing confusion, especially before a procedure.

Follow-up for an unexpected result is generally routine. Seek urgent medical care for uncontrolled bleeding, coughing or vomiting blood, chest pain, sudden shortness of breath, or a painful swollen leg. These symptoms require prompt assessment regardless of the factor XII result.

Common questions

Can I drink coffee before a factor XII assay?

Yes. Coffee does not usually affect the test. Follow any fasting instructions for other tests being collected.

Does the time of day matter?

Usually not. Timing may matter if you take an anticoagulant because its concentration changes after each dose.

Can I exercise beforehand?

Ordinary activity is unlikely to affect the result. If blood draws make you feel faint, arrive rested and well hydrated.

Do I need to stop my blood thinner?

Do not stop it unless the clinician managing it gives specific instructions. Information about the medicine and dose timing can help the laboratory interpret your result.

Why is my aPTT long if I do not bleed unusually?

Factor XII helps start the aPTT reaction in a test tube. Its deficiency can therefore cause a very long aPTT without the bleeding seen with some other factor deficiencies.

Will I need the assay more than once?

Possibly. A repeat may be useful if the result is borderline, the sample was unsuitable, you recently received plasma, or a medicine or antibody may have interfered.

Sources

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