TEST

Platelet aggregation test

A blood test that measures how well platelets stick together to form a clot.

WHAT IT MEASURES
How platelets clump after exposure to activating substances

SAMPLE
Blood

FASTING NEEDED?
Sometimes, when the laboratory requests it to reduce sample cloudiness

HOW LONG IT TAKES
About 10 minutes for blood collection

RESULTS IN
Several days to weeks, varying by laboratory

USED FOR
Diagnosing suspected platelet function disorders

MAIN LIMITATION
Medicines and sample handling can produce misleading patterns

Overview

A platelet aggregation test measures how well your platelets respond when they are stimulated to form a clot. Platelets are small blood cells that stick to damaged blood vessels and to one another. This is one of the first steps in stopping bleeding.

The test is also called platelet aggregometry. The most established method is light transmission aggregometry . It measures changes in light passing through a sample as platelets clump together. Some laboratories use whole-blood impedance aggregometry , which measures electrical changes as platelets collect on a surface.

Platelet aggregation testing is more specialised than a routine blood count. It is usually performed in a laboratory with experience in bleeding and clotting disorders. The sample must be collected and processed carefully because platelets can be affected by medicines, illness, collection technique and delays.

Why the test is ordered

This test may help investigate bleeding that suggests platelets are not working normally. Examples include frequent nosebleeds, unusually heavy menstrual bleeding, easy bruising, prolonged bleeding after dental work or unexpectedly heavy bleeding during surgery.

A platelet count tells you how many platelets are present. An aggregation test asks how well they work. A person can have a normal platelet count but reduced platelet function.

The test may be ordered to look for an inherited platelet disorder, such as Glanzmann thrombasthenia or Bernard-Soulier syndrome. It can also help investigate acquired platelet dysfunction caused by a health condition or medicine.

In some settings, aggregation testing is used to assess the effect of antiplatelet medicines. However, routine testing of everyone taking these medicines is not generally necessary. The reason for testing should be clear because results do not always predict whether an individual will bleed or develop a clot.

Who should have the test

Platelet aggregation testing is not a general screening test. It is most useful when your medical history suggests a platelet problem and initial tests have not explained the bleeding.

Testing may be considered when you have:

A clinician will usually review your personal and family bleeding history first. Other tests may include a complete blood count, blood film, clotting tests and tests for von Willebrand disease, a common inherited bleeding disorder.

Testing during active illness or soon after a platelet transfusion may not show your usual platelet function.

- Repeated or unexplained bleeding from the nose, gums or other moist surfaces
- Heavy menstrual bleeding or excessive bleeding after childbirth
- Unusual bleeding after surgery, injury or dental treatment
- A close relative with a diagnosed platelet function disorder
- Normal or near-normal initial clotting tests despite a convincing bleeding history

How to prepare

Follow the instructions from the testing laboratory. Preparation requirements differ because platelet testing methods are not fully standardised.

Tell the clinician and laboratory about every medicine you use, including non-prescription medicines, supplements and herbal products. Aspirin, anti-inflammatory pain medicines such as ibuprofen or naproxen, and prescription antiplatelet medicines can substantially change the result. Some antidepressants like sertraline or fluoxetine , antibiotics and supplements may also affect platelet activity.

Do not stop a prescribed medicine on your own. Stopping an antiplatelet medicine can be unsafe for some people. The clinician who ordered the test should decide whether any medicine can be paused and for how long.

Some laboratories request fasting because a fatty or cloudy blood sample can interfere with light-based testing. Plain water is usually acceptable, but follow your laboratory's instructions about food, coffee and other drinks.

Avoid smoking immediately before collection. Ask whether you should avoid strenuous exercise on the day, as exercise can temporarily alter platelet activity.

What happens during the test

A healthcare professional draws blood from a vein, usually in your arm. Several tubes may be needed because the laboratory must test your platelets with different substances.

The tubes contain citrate, which prevents the blood from clotting before analysis. Correct tube filling and gentle handling are important. Shaking, chilling or delaying the sample can activate or damage platelets.

For light transmission aggregometry, the laboratory separates platelet-rich plasma from the rest of the blood. It then adds substances that normally activate platelets, such as ADP, collagen, arachidonic acid and ristocetin. The instrument records how the sample changes as platelets respond.

The blood collection usually takes about 10 minutes. Laboratory analysis takes longer and often must begin within a few hours. No sedation is needed.

Understanding your results

The result is usually a set of response curves rather than one simple number. The laboratory looks at how quickly and strongly your platelets react to each test substance.

Different response patterns can suggest different explanations. For example, a reduced response to arachidonic acid may occur after aspirin use. A specific ristocetin pattern can point

toward a problem involving von Willebrand factor or the platelet receptor that binds to it. These findings are not diagnoses by themselves.

Results may be reported as normal, reduced, absent or unusually strong responses. They should be interpreted alongside your bleeding history, platelet count, blood film, medicines and other clotting tests.

Reference ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines and clinical context. Use the range and comments provided with your own report rather than comparing it with values found online.

What affects the results

Platelet aggregation is particularly sensitive to factors that can change platelet behaviour even when the laboratory equipment is working correctly.

Important influences include:

Tell the laboratory when you last took relevant medicines. A result affected by aspirin, for example, may accurately show aspirin's effect but may not reveal how your platelets work without it.

- Aspirin and other anti-inflammatory pain medicines
- Prescription antiplatelet medicines, including P2Y12 inhibitors
- Some antidepressants, antibiotics like amoxicillin or doxycycline , antihistamines and herbal products
- A recent platelet transfusion, which can temporarily mask an inherited problem
- A low platelet count or certain abnormalities in red or white blood cells
- Pregnancy, acute illness, inflammation and some kidney or liver conditions
- Smoking, alcohol use and recent strenuous exercise
- A fatty meal, which may make plasma cloudy and disrupt light measurement
- A difficult blood draw, underfilled tube, clot in the sample or vigorous shaking
- Incorrect sample temperature or a long delay before testing

Accuracy and limitations

When collection and processing are well controlled, light transmission aggregometry can

identify many significant platelet function abnormalities. It is often treated as the main laboratory method for investigating inherited platelet dysfunction.

It is not perfect. Mild or intermittent disorders may be missed, so a normal result does not completely rule out a platelet problem. Conversely, medicines, illness or poor sample handling can produce an abnormal pattern when you do not have an inherited disorder.

Testing methods and reporting differ between laboratories. The procedure also requires fresh samples and experienced staff, which can make repeat testing necessary. An unexpected abnormal result is often confirmed on another day, especially when a medicine or sample issue could explain it.

Other tests may be better for particular questions. Von Willebrand factor tests assess suspected von Willebrand disease. Flow cytometry can measure platelet surface proteins and may help confirm disorders such as Glanzmann thrombasthenia or Bernard-Soulier syndrome. Genetic testing may identify an inherited cause, while electron microscopy can examine platelet storage granules. Short screening tests of platelet closure time cannot replace a full clinical assessment or specialised aggregation testing.

Risks and complications

The risks are those of an ordinary blood draw. You may have brief discomfort, a small bruise or feel faint.

Pressure on the puncture site usually stops minor bleeding. Contact the testing service if the site continues to bleed despite firm pressure or develops increasing swelling.

What happens next

A clinician will interpret the pattern with your symptoms, family history and other results. Routine follow-up may involve reviewing medicines, repeating the test under better-controlled conditions or arranging more specific platelet, von Willebrand factor or genetic tests.

If a platelet disorder is confirmed, you may be referred to a haematology service. Your care plan may include advice for dental work, surgery, pregnancy or medicines that affect platelets.

Seek urgent medical help for heavy bleeding that does not stop with firm pressure, vomiting blood, passing black or bloody stools, or bleeding accompanied by fainting or marked weakness. Sudden severe headache, confusion, weakness on one side or difficulty speaking requires emergency care.

Common questions

Can I drink coffee before a platelet aggregation test?

Follow the laboratory's instructions. If fasting is required, coffee may not be allowed, even without milk. Caffeine may also affect platelet responses in some circumstances, so ask before the appointment.

Can I eat beforehand?

Sometimes. Some laboratories request fasting because fat in the blood after a meal can make plasma cloudy and interfere with light-based measurement. Plain water is usually acceptable.

Does the time of day matter?

The sample is often collected in the morning so it can reach the specialist laboratory and be tested promptly. Follow your scheduled time because delayed processing can make the result unreliable.

Can I exercise before the test?

Avoid strenuous exercise if the laboratory advises it. Exercise can temporarily change platelet activation and may make the result less representative of your usual state.

Should I stop aspirin or ibuprofen?

Not unless the clinician who ordered the test tells you to. These medicines can affect the result, but stopping aspirin or another prescribed antiplatelet medicine may carry important risks.

Why might I need the test again?

Repeat testing may be needed when the first result is unexpected, the sample was delayed, your platelet count was too low or a medicine may have interfered. Repeating an abnormal result can help distinguish a persistent disorder from a temporary effect.

Sources

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