CONDITION

Fibrinolysis - primary or secondary

Excessive fibrinolysis is the abnormal breakdown of blood clots, which can cause persistent or delayed bleeding.

WHAT IT IS
Excessive breakdown of blood clots, primary or secondary

BODY SYSTEM
Blood and circulation

MAIN SYMPTOMS
Persistent bleeding, easy bruising, nosebleeds, heavy periods

WHAT CAUSES IT
Inherited protein defects or acquired clotting disorders

HOW IT IS DIAGNOSED
Blood tests and specialised clot-lysis testing

MAIN TREATMENT
Cause treatment, bleeding support, and antifibrinolytic medicines

CAN IT BE CURED?
Sometimes - acquired causes may resolve

IS IT AN EMERGENCY?
Sometimes - uncontrolled or internal bleeding

LONG-TERM OUTLOOK
Often good when the cause is controlled

Overview

Fibrinolysis is the body's normal process for breaking down blood clots after they have done their job. An enzyme called plasmin cuts apart fibrin, the protein mesh that holds a clot together.

Problems develop when this process becomes too active or happens too early. This is called excessive fibrinolysis or hyperfibrinolysis . A clot may form but then dissolve before a damaged blood vessel has healed. Bleeding may continue or restart after it seemed to stop.

The terms primary and secondary describe how the excess fibrinolysis began:

The distinction matters because treatment must address the underlying process. Secondary fibrinolysis may occur as part of disseminated intravascular coagulation, or DIC, a serious

condition involving abnormal clotting and bleeding throughout the body. Primary fibrinolysis is not the same as DIC.

- Primary fibrinolysis starts without widespread activation of the clotting system. It may result from an inherited protein problem or an acquired illness.
- Secondary fibrinolysis happens in response to extensive clot formation. The body activates fibrinolysis to break down those clots.

Symptoms

Symptoms depend on how quickly clots break down and what caused the problem. Some inherited forms cause bleeding from childhood, while an acquired form may appear during a major illness, operation, injury, or pregnancy-related complication.

Possible symptoms include:

Severe cases can cause internal bleeding or major blood loss. If secondary fibrinolysis is part of DIC, there may also be organ problems caused by abnormal small clots.

- Bleeding that lasts longer than expected after injury, surgery, or dental work
- Bleeding that stops and then restarts hours later
- Frequent nosebleeds or bleeding from the gums
- Easy or large bruises
- Heavy or prolonged menstrual bleeding
- Oozing from wounds, injections, intravenous lines, or surgical sites
- Blood in the urine or bowel movements

Causes and risk factors

The clot-breaking system is normally controlled by several proteins. Plasmin breaks down fibrin, while proteins such as alpha-2 antiplasmin and plasminogen activator inhibitor-1, or PAI-1, prevent excessive plasmin activity.

Rare inherited conditions can disrupt this balance. Examples include alpha-2 antiplasmin deficiency and complete PAI-1 deficiency. These conditions may cause delayed bleeding because an initial clot forms but does not remain stable. They can affect several members of a family, although a person may be the first known relative to receive a diagnosis.

Acquired primary fibrinolysis can be associated with severe liver disease, because the liver

makes and clears many proteins involved in clotting and clot breakdown. Certain cancers, particularly some blood or prostate cancers, may also activate fibrinolysis. Major operations involving the liver, prostate, heart, or circulation can sometimes contribute.

Secondary fibrinolysis follows increased clot formation. It may be seen with DIC caused by conditions such as:

DIC does not always produce the same fibrinolytic pattern. In some forms, clot breakdown is increased; in others, it is reduced. A clinician therefore needs to interpret the tests alongside the underlying illness.

- Severe infection
- Major trauma or extensive tissue injury
- Some cancers
- Serious pregnancy or childbirth complications
- Severe reactions involving the blood or circulation

Diagnosis

There is no single routine blood test that confirms every case. Diagnosis is based on the bleeding pattern, medical circumstances, and a combination of laboratory results.

Initial tests commonly include a full blood count with a platelet count, prothrombin time, activated partial thromboplastin time, and fibrinogen level. These examine different parts of clot formation. Tests for fibrin degradation products and D-dimer measure substances released as fibrin or related proteins are broken down.

In primary fibrinolysis, the platelet count and routine clotting times may remain normal. Fibrinogen can fall if breakdown is extensive. Fibrin degradation products may rise without the same degree of D-dimer elevation seen after widespread breakdown of cross-linked clots. This pattern is not reliable enough to make the diagnosis by itself.

Specialised tests may include:

These tests are not available in every laboratory, and some can miss mild or intermittent abnormalities. Repeat or specialist testing may be needed.

If DIC is suspected, clinicians assess changes in platelets, clotting times, fibrinogen, and D-dimer together with the clinical situation. Established scoring systems can support the diagnosis, but they do not replace assessment of the underlying illness.

- Euglobulin clot lysis time , which measures how quickly a laboratory clot dissolves

- Viscoelastic testing , such as thromboelastography or rotational thromboelastometry, which tracks clot formation and breakdown in whole blood
- Tests of alpha-2 antiplasmin, PAI-1, plasminogen, or related proteins
- Genetic testing when an inherited condition is suspected

Treatment and management

Treatment depends on whether the problem is primary or secondary, whether bleeding is active, and what caused it.

The main priority in an acquired condition is treating the cause. This might involve controlling an infection, managing a pregnancy-related emergency, treating liver disease or cancer, repairing major tissue injury, or controlling bleeding during an operation.

Antifibrinolytic medicines, such as tranexamic acid or epsilon-aminocaproic acid, slow clot breakdown. They may be used for some inherited conditions, bleeding from certain sites, or selected surgical situations. They can also be planned around dental work or procedures in people with a confirmed fibrinolytic disorder.

These medicines are not appropriate for every cause. In DIC or another condition involving widespread clot formation, slowing fibrinolysis could increase harmful clotting in some circumstances. Their use is therefore based on the specific clotting pattern and specialist assessment rather than on bleeding alone.

Significant blood loss may require red blood cell transfusion. Plasma, platelets, cryoprecipitate, or fibrinogen replacement may be used when particular blood components are low. The choice is guided by test results and the clinical setting.

People with an inherited condition may benefit from a written bleeding plan. This can explain the diagnosis, previous effective treatment, and arrangements for surgery, childbirth, or dental care.

Complications

The main complication is continued or recurrent bleeding. This can lead to iron deficiency, anaemia, poor wound healing, or the need for transfusion. Major bleeding can affect the brain, digestive tract, muscles, or other internal organs.

When secondary fibrinolysis occurs with DIC, abnormal small clots may reduce blood flow to organs while clotting factors are being consumed. This can produce both clotting and bleeding

complications at the same time.

Treatment also requires care because medicines that preserve clots can sometimes contribute to unwanted clotting.

Prevention

Inherited fibrinolytic conditions cannot currently be prevented. If one is confirmed, planning can reduce bleeding around surgery, dental work, injury, menstruation, or childbirth.

Many acquired cases cannot be predicted. Prompt treatment of the underlying illness may help correct the clotting imbalance. If you have a known fibrinolytic disorder, tell your healthcare team before procedures and before starting medicines that may affect bleeding.

Do not stop prescribed aspirin, anticoagulants like warfarin or apixaban , or other medicines on your own. A clinician can weigh their purpose against your bleeding risk.

Living with it and what to expect

An acquired episode may improve when its cause is controlled. Recovery can occur over days or weeks, but the timing is influenced by the severity of the illness and whether the liver, bone marrow, or other organs are affected. The problem may return if the underlying condition remains active.

Inherited forms are lifelong. The tendency to break down clots does not disappear, although bleeding frequency can change over time. Some people mainly have problems after operations or injuries. Others experience recurrent nosebleeds, heavy periods, or delayed bleeding from wounds.

Regular haematology follow-up may include reviewing bleeding episodes, checking for anaemia or iron deficiency, and updating plans for procedures. Family testing may be discussed when a specific inherited change is found.

Most day-to-day activities do not need to be avoided automatically. Advice about contact sports, travel, pregnancy, and procedures should reflect the type and severity of the confirmed disorder. Carrying a medical alert card or digital record can be useful if emergency treatment is needed.

When to get medical help

Call emergency services now for:

These can be signs of major blood loss or internal bleeding.

Seek urgent medical advice the same day for new blood in the urine, repeated nosebleeds, rapidly increasing bruising, persistent wound oozing, or menstrual bleeding much heavier than usual.

Arrange routine follow-up if you have repeated unexplained bleeding, bleeding that restarts after dental work or minor injuries, or a family history of an uncommon bleeding disorder. If you already have a diagnosis, contact your usual team before planned surgery, dental extraction, or pregnancy care.

- Bleeding that is heavy or does not stop with firm pressure
- Vomiting blood, coughing up blood, or passing black or heavily bloody stools
- A sudden severe headache, confusion, weakness, fainting, or seizure
- Significant bleeding after childbirth, surgery, or a major injury
- Pale or clammy skin, severe breathlessness, a racing heartbeat, or collapse

Common questions

Is fibrinolysis always abnormal?

No. Normal fibrinolysis removes clots after a blood vessel has healed. The condition described here is excessive or poorly controlled fibrinolysis that causes bleeding or forms part of another clotting disorder.

What is the difference between primary and secondary fibrinolysis?

Primary fibrinolysis begins through direct overactivity of the clot-breaking system. Secondary fibrinolysis is triggered by increased clot formation. The terms describe the mechanism, not how severe the bleeding is.

Is primary fibrinolysis the same as DIC?

No. Primary fibrinolysis can occur without widespread clot formation or consumption of platelets. DIC activates clotting throughout the circulation and can then trigger secondary fibrinolysis. Laboratory results and the underlying illness help separate them.

Can routine clotting tests be normal?

Yes. Prothrombin time, activated partial thromboplastin time, and platelet count may be normal in some primary fibrinolytic disorders. Specialised clot-lysis or protein tests may be needed when the bleeding history suggests a problem.

Can excessive fibrinolysis be cured?

An acquired episode can sometimes resolve when its cause is treated. Inherited protein deficiencies are not currently curable, but bleeding can often be managed with planning and appropriate treatment.

Can I take aspirin or ibuprofen?

These medicines can affect bleeding, but the risk differs between people and medicines. Do not stop prescribed aspirin or another blood-thinning treatment without advice. Ask a clinician or pharmacist before using non-prescription anti-inflammatory painkillers if you have a diagnosed bleeding disorder.

Sources

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