CONDITION

Factor VII deficiency

Factor VII deficiency is a rare bleeding condition caused by too little working factor VII, a protein needed for blood to clot.

WHAT IT IS
Rare shortage of working clotting factor VII

BODY SYSTEM
Blood and clotting

MAIN SYMPTOMS
Nosebleeds, easy bruising, heavy periods, bleeding after procedures

WHAT CAUSES IT
Usually inherited F7 gene changes; sometimes acquired

HOW IT IS DIAGNOSED
Clotting tests and a factor VII activity assay

MAIN TREATMENT
Factor replacement and medicines that stabilise clots

CAN IT BE CURED?
Sometimes - acquired deficiency may reverse; inherited deficiency does not

IS IT AN EMERGENCY?
Sometimes - uncontrolled bleeding or possible internal bleeding

LONG-TERM OUTLOOK
Often manageable with specialist planning and treatment

Overview

Factor VII deficiency is a rare bleeding condition in which the blood has too little factor VII or the factor does not work properly.

Factor VII is a protein involved in blood clotting. When a blood vessel is damaged, it works with tissue factor to start reactions that form a stable clot. Without enough working factor VII, clotting can take longer and bleeding may continue longer than expected.

The condition is usually inherited because of a gene change passed through a family. Less often, factor VII activity becomes low because of another medical condition or medicine. This is called acquired factor VII deficiency.

Factor VII levels do not always predict bleeding severity. Someone with a very low level may

have few problems, while someone with a higher level may bleed more often. Personal bleeding history is therefore important when planning care.

Some people are diagnosed after an unusual blood test or bleeding following surgery. Severe deficiency may cause symptoms during infancy or childhood.

Symptoms

Symptoms range from none to serious bleeding. Possible symptoms include:

Heavy periods or repeated bleeding can cause iron-deficiency anaemia, leading to tiredness, weakness, headaches, shortness of breath, or pale skin.

Severe deficiency can cause bleeding in the digestive system or brain. Bleeding around the brain is a particular concern in severely affected babies and young children, although it can occur at any age.

Previous bleeding during injuries, procedures, periods, or childbirth may help predict future risk better than the measured factor VII level alone.

- Frequent or prolonged nosebleeds
- Easy bruising or bleeding gums
- Bleeding that lasts longer than expected after an injury
- Heavy or prolonged menstrual bleeding
- Excessive bleeding after dental work, surgery, childbirth, or circumcision
- Bleeding into a joint or muscle, causing pain, swelling, or reduced movement
- Blood in urine, vomit, or bowel movements

Causes and risk factors

Inherited factor VII deficiency is caused by changes in the _F7_ gene, which provides instructions for making factor VII.

It usually follows an autosomal recessive inheritance pattern, meaning a person inherits an altered gene copy from each parent. Parents with one altered copy are usually unaffected, although some have slightly reduced factor levels.

If both parents are carriers, each pregnancy has:

These chances are the same for children of any sex. A genetic counsellor can explain the

pattern for an individual family.

Acquired factor VII deficiency is not inherited. Causes include severe liver disease, vitamin K deficiency, and medicines that block vitamin K, such as warfarin. Rarely, an immune-system antibody interferes with factor VII.

- A 1 in 4 chance of the child having factor VII deficiency
- A 1 in 2 chance of the child being a carrier
- A 1 in 4 chance of the child inheriting neither altered copy

Diagnosis

Diagnosis begins with medical and family history, including bleeding after injuries, operations, dental treatment, childbirth, or during periods.

Initial blood tests usually include:

Factor VII deficiency typically causes a prolonged PT or INR with a normal aPTT. Other conditions can produce this pattern, so it does not confirm the diagnosis.

A factor VII activity assay measures how well the protein works. Testing may be repeated because illness, medicines, pregnancy, vitamin K levels, and laboratory differences can affect results.

In a mixing study, the person's plasma is combined with normal plasma. Correction of the clotting time suggests a missing clotting factor; failure to correct may indicate an interfering antibody.

Further tests can assess liver function, vitamin K-related factors, or inhibitors. Genetic testing may identify an _F7_ gene change and help with family testing, but it is not always needed for treatment.

- Prothrombin time, or PT: Measures clotting through a pathway that includes factor VII
- International normalised ratio, or INR: A standardised way of reporting PT
- Activated partial thromboplastin time, or aPTT: Measures another part of the clotting process

Treatment and management

Treatment depends on the location and severity of bleeding, previous bleeding history, factor VII activity, and any planned procedure. Not everyone needs regular treatment.

Recombinant activated factor VII is a laboratory-made clotting protein commonly used for significant bleeding or around surgery in inherited deficiency. Its effect is relatively short, so several administrations may be needed.

If this is unavailable or unsuitable, specialists may consider plasma-derived factor VII concentrate, prothrombin complex concentrate, or fresh frozen plasma. These differ in factor content, fluid volume, and risk of unwanted blood clots.

Tranexamic acid helps prevent clots from breaking down too quickly. It may be used for nose or mouth bleeding, heavy periods, and some dental procedures. Hormonal treatment can also reduce menstrual bleeding.

Preventive treatment, called prophylaxis, may be considered for repeated serious bleeding, especially into the brain, joints, digestive system, or other important areas. It is not routinely needed by everyone.

Before surgery, childbirth, or invasive dental work, ask the haematology team for a written plan. It may include factor treatment, tranexamic acid, blood tests, and observation afterwards.

Do not start aspirin or non-steroidal anti-inflammatory medicines such as ibuprofen without checking whether they are appropriate. These medicines can affect platelets and increase bleeding. Do not stop prescribed medicine without medical advice.

Complications

Repeated blood loss can cause iron-deficiency anaemia, particularly with heavy periods or frequent nosebleeds.

Repeated bleeding into a joint may damage cartilage and cause lasting pain, stiffness, or reduced movement. This is less common than in haemophilia but can occur in severe deficiency.

Bleeding into the brain, digestive system, throat, or another internal area can be serious. Prompt assessment reduces the risk of lasting harm.

Clotting-factor products can occasionally cause allergic reactions or unwanted blood clots. Rarely, the immune system develops an inhibitor that reduces treatment effectiveness.

Pregnancy and childbirth may increase bleeding risk, including after delivery. Factor VII levels can change during pregnancy but do not reliably predict bleeding, so planning with obstetric, anaesthetic, and haematology teams is important.

Prevention

Inherited factor VII deficiency cannot be prevented. Genetic counselling can help families understand inheritance, testing, and reproductive options.

Planning can prevent some complications. Tell healthcare and dental professionals about the condition before procedures. Carry medical alert identification and keep your written emergency treatment plan available.

Use suitable protective equipment during activities with an injury risk. Regular dental care may reduce the need for invasive treatment. Early management of heavy periods or repeated bleeding can help prevent iron deficiency.

Acquired deficiency may improve when the underlying cause is treated. Management might involve correcting vitamin K deficiency, reviewing medicines, or treating liver disease under medical supervision.

Living with it and what to expect

Inherited factor VII deficiency is lifelong, although many people with mild deficiency lead active lives and need treatment only for injuries, procedures, surgery, or childbirth.

People with severe or repeated bleeding may need closer follow-up or prophylaxis. Bleeding risk and treatment plans can change because of illness, medicines, pregnancy, or other health changes.

Regular follow-up with a haemophilia or bleeding-disorders centre helps keep emergency and procedure plans current. Reviews may include checks for anaemia, joint problems, treatment side effects, and changes in menstrual bleeding.

Children can usually attend school and take part in suitable physical activity. Exercise supports strength, balance, and joint health. Contact or high-impact activities should be discussed according to the child's bleeding history and care plan.

Periods, contraception, pregnancy, and menopause can affect bleeding. Coordinated care from bleeding-disorders and reproductive health teams can help manage these stages.

When to get medical help

Seek emergency medical care for:

Use your emergency treatment plan if you have one, and tell the emergency team that you have factor VII deficiency.

Contact your bleeding-disorders team promptly about a joint or muscle bleed, repeated nosebleeds, blood in urine, worsening menstrual bleeding, or bleeding after a procedure.

Use routine follow-up to update procedure plans, discuss pregnancy or activity choices, check iron levels, and report gradual changes in bruising or bleeding.

- A significant head injury, especially with headache, vomiting, confusion, unusual sleepiness, weakness, or a seizure
- Heavy bleeding that cannot be controlled or causes faintness
- Vomiting or coughing up blood
- Black, tar-like bowel movements or a large amount of visible blood
- Sudden severe abdominal, back, chest, or joint pain with swelling
- Trouble breathing, swallowing, speaking, or moving part of the body
- Heavy bleeding during pregnancy or after childbirth

Common questions

Is factor VII deficiency the same as haemophilia?

No. Haemophilia A and B involve factors VIII and IX. Factor VII deficiency affects another part of the clotting process and produces a different blood-test pattern.

Does a very low factor VII level mean I will bleed severely?

Not necessarily. Factor VII activity does not always match bleeding severity. Previous bleeding, current health, and the type of injury or procedure also matter.

Can I have dental work or surgery?

Usually, but it must be planned in advance. Depending on the procedure and your history, you may need factor treatment, tranexamic acid, observation, or no special treatment. Give the dental or surgical team your written plan before treatment.

Can factor VII deficiency be passed to my children?

Yes. Inherited deficiency is usually autosomal recessive, so the chance depends partly on whether the other biological parent carries an altered _F7_ gene. Genetic counselling and carrier testing can clarify the risk.

Can I exercise and play sports?

Many people can exercise regularly. Suitable activities depend on bleeding history and joint health. Collision sports may require individual risk planning.

Does factor VII deficiency affect pregnancy?

It can increase bleeding during miscarriage, delivery, or after birth, although experiences vary. Planning before pregnancy or early in pregnancy allows teams to prepare for delivery and pain-relief options.

Sources

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