CONDITION

Polycythemia vera

Polycythemia vera is a long-term blood condition that makes too many blood cells and raises the risk of clots.

WHAT IT IS
Blood condition causing excess blood cell production

BODY SYSTEM
Blood and circulation

MAIN SYMPTOMS
Headaches, fatigue, dizziness, itching after bathing

WHAT CAUSES IT
Acquired JAK2 gene change in blood-forming cells

HOW IT IS DIAGNOSED
Blood counts, JAK2 testing, and bone marrow examination

MAIN TREATMENT
Blood removal, antiplatelet therapy, blood-count-lowering medicines

CAN IT BE CURED?
Sometimes - transplant can cure selected people

IS IT AN EMERGENCY?
Sometimes - chest pain or stroke signs

LONG-TERM OUTLOOK
Often controlled for years, with clot and progression risks

Overview

Polycythemia vera, or PV, is a long-term condition in which the bone marrow makes too many blood cells. The bone marrow is the soft tissue inside certain bones where blood cells are produced.

PV mainly increases red blood cells, which carry oxygen. It may also raise the number of white blood cells and platelets. Platelets help blood clot.

Having too many red blood cells increases the proportion of blood made up of cells, called the hematocrit . This can slow blood flow and raise the risk of a blood clot. Clots may lead to problems such as a stroke, heart attack, deep vein thrombosis, or pulmonary embolism.

PV belongs to a group called myeloproliferative neoplasms . These are blood cancers in which

the bone marrow makes too many cells. PV usually develops slowly, and many people live with it for years while receiving regular monitoring and treatment.

"Splenomegalic polycythemia" is an older name. It refers to enlargement of the spleen, which can happen in PV but is not present in everyone.

Symptoms

PV may be found through a routine blood test before it causes symptoms. When symptoms occur, they may result from sluggish blood flow, an enlarged spleen, or substances released by the extra blood cells.

Possible symptoms include:

The discomfort under the left ribs may come from an enlarged spleen. The spleen filters blood and helps the immune system. It can grow when it has to process more blood cells than usual.

Some people develop erythromelalgia , which causes burning pain, warmth, and redness in the hands or feet. Others have gout, a painful form of joint inflammation caused by a buildup of uric acid.

Symptoms alone cannot confirm PV. Other conditions can cause the same problems.

- Headaches, dizziness, tiredness, or blurred vision
- Itching, especially after a warm bath or shower
- Redness, burning, or pain in the hands or feet
- Unusual sweating, particularly at night
- Fullness or discomfort under the left ribs
- Feeling full soon after starting a meal
- Ringing in the ears or difficulty concentrating
- Unexplained weight loss

Causes and risk factors

PV usually results from an acquired change in a gene called JAK2 . This gene helps control blood cell production. The change keeps growth signals switched on, so affected bone marrow cells produce more blood cells than the body needs.

"Acquired" means that the gene change develops in a blood-forming cell during life. It is not

usually present from birth, and PV is not generally passed directly from parent to child.

Some families have a greater tendency to develop myeloproliferative conditions, but inheriting this tendency does not mean someone will develop PV.

PV is more often diagnosed in older adults, although it can occur at other ages. Age does not cause the condition.

Factors such as older age and a previous blood clot increase the risk of future clotting complications. Smoking, high blood pressure, high cholesterol, diabetes, and limited movement can add to the overall risk of heart and circulation problems.

Diagnosis

A complete blood count may show a high hemoglobin level, a high hematocrit, or an increased number of red blood cells. Hemoglobin is the oxygen-carrying protein inside red blood cells. White blood cells and platelets may also be raised.

A high red blood cell count does not always mean PV. The body can make extra red blood cells in response to low oxygen, smoking, lung or heart conditions, sleep apnea, certain medicines, or living at high altitude. Dehydration can make the count appear high by reducing the liquid part of the blood.

Testing commonly includes:

During a bone marrow biopsy, a clinician uses a needle to collect a small sample, usually from the back of the pelvic bone. Local anesthetic is used to numb the area.

Diagnosis is based on a combination of blood results, gene testing, and bone marrow findings. Tests may also be used to rule out other causes of a high red blood cell count.

- Repeat blood counts to confirm that the increase continues
- A blood test for the JAK2 V617F gene change
- Testing for other JAK2 changes if the first test is negative
- An erythropoietin level, which is often low in PV
- A bone marrow biopsy to examine blood-forming cells

Treatment and management

Treatment aims to reduce the risk of blood clots, control symptoms, and keep blood counts in a safer range. The plan is based on factors such as age, previous clots, symptoms, blood

counts, pregnancy plans, and other health conditions.

Phlebotomy , also called venesection, is a common treatment. It involves removing blood through a needle, much like a blood donation. This lowers the number of circulating red blood cells. Treatment usually aims to keep the hematocrit below 45%, although monitoring and scheduling are individualized.

Low-dose aspirin is often used to make platelets less likely to form unwanted clots. It is not suitable for everyone, particularly when there is a significant bleeding risk or another reason to avoid aspirin.

Some people need medicine that reduces blood cell production. Options include hydroxycarbamide, also called hydroxyurea, and forms of interferon. Ruxolitinib may be considered when hydroxycarbamide has not worked adequately or has caused unacceptable side effects.

Treatment choices require particular care during pregnancy or when planning a pregnancy. Your hematology team can review which medicines and monitoring approaches are appropriate before conception, during pregnancy, and after delivery.

Regular follow-up may include blood counts, symptom reviews, examination of the spleen, and checks for treatment side effects. Managing blood pressure, cholesterol, diabetes, and smoking also helps reduce the overall risk of circulation problems.

A stem cell transplant can replace abnormal blood-forming cells with cells from a donor. It carries serious risks and is rarely used for stable PV. It may be considered for selected people whose condition has progressed to advanced myelofibrosis or acute leukemia.

Complications

The main complication is thrombosis , meaning a blood clot inside a blood vessel. A clot can block blood flow in an artery or vein. PV can sometimes cause clots in unusual places, including blood vessels that drain the liver or intestines.

Bleeding can also occur. Possible signs include frequent nosebleeds, easy bruising, bleeding from the gums, or blood in urine or stool. Very high platelet counts can sometimes interfere with normal clotting rather than improve it.

Other possible complications include:

Progression does not happen to everyone. Your blood counts, symptoms, spleen size, and bone marrow findings help the care team watch for changes.

Iron deficiency may be an intended effect of phlebotomy because iron is needed to make red

blood cells. Do not start an iron supplement for suspected deficiency without discussing it with your hematology team. Replacing iron can increase red blood cell production.

- An enlarged spleen causing discomfort or early fullness
- Gout or kidney stones related to high uric acid
- Iron deficiency caused or worsened by repeated phlebotomy
- Progression to myelofibrosis, in which scar tissue disrupts bone marrow
- Progression to acute myeloid leukemia, an aggressive blood cancer

Prevention

There is no known way to prevent the acquired JAK2 change that causes most cases of PV.

Treatment can reduce the chance of complications. Keeping scheduled blood tests and phlebotomy appointments is important even when you feel well.

You can also address other factors that affect blood vessels. This may include avoiding smoking, staying physically active within your abilities, and receiving appropriate care for high blood pressure, diabetes, or high cholesterol. During long journeys, regular movement may help reduce immobility.

Food, vitamins, and supplements cannot prevent or cure PV. Some supplements can affect bleeding or interact with treatment, so check with your healthcare team before taking them.

Living with it and what to expect

PV is usually a lifelong condition. Blood counts may improve with treatment, but the underlying abnormal blood-forming cells remain. Most people continue to need monitoring even when they have no symptoms.

At first, blood tests or phlebotomy may be frequent while the hematocrit is brought under control. Appointments may become less frequent after blood counts stabilize. Treatment may need to change over time because of symptoms, side effects, new health issues, or changes in blood counts.

Many people have long periods when PV is stable and daily activities continue as usual. Fatigue, itching, headaches, or concentration problems can still affect quality of life even when blood results look controlled. Tell your care team about persistent symptoms rather than assuming they are unavoidable.

Gentle exercise may support circulation and energy, but activity should match how you feel and any other medical conditions. Avoid scratching itchy skin when possible. Cooler or shorter showers, fragrance-free moisturizers, and prescribed treatments may help with bathing-related itching.

The long-term course is different for each person. Some people remain stable for many years. Others develop troublesome symptoms, recurrent clots, an enlarged spleen, myelofibrosis, or, less commonly, acute leukemia. Follow-up is intended to identify these changes early and adjust care.

When to get medical help

Call emergency services for symptoms that could mean a stroke, heart attack, pulmonary embolism, or another serious clot. These include:

Seek prompt medical assessment for new pain, warmth, redness, and swelling in one leg or arm. These can be signs of a deep vein thrombosis.

Contact your usual care team soon for increasing headaches, worsening itching, new bruising or bleeding, repeated nosebleeds, growing discomfort under the left ribs, unexplained weight loss, fever, drenching night sweats, or a major change in energy.

Routine follow-up is appropriate when you feel stable and are attending planned blood tests and treatment visits. Do not wait for the next routine appointment if new symptoms are significant or worsening.

- Sudden weakness or numbness, especially on one side
- A drooping face, new speech difficulty, or sudden confusion
- Sudden severe chest pain, pressure, or shortness of breath
- Coughing up blood, fainting, or severe unexplained breathlessness
- A suddenly cold, pale, painful, or weak arm or leg
- Heavy bleeding that will not stop

Common questions

Is polycythemia vera a type of cancer?

Yes. PV is classified as a chronic blood cancer called a myeloproliferative neoplasm. It usually behaves differently from fast-growing cancers. It often develops slowly and may be managed

for years with blood removal, medicines, and monitoring.

How long can you live with polycythemia vera?

Many people live for years or decades after diagnosis, but an individual outlook cannot be predicted from the diagnosis alone. Age, previous blood clots, other health conditions, treatment response, and progression to myelofibrosis or leukemia all affect the outlook.

Why do I itch after a shower?

PV can increase the release of substances that activate nerves involved in itching. Warm water may trigger or worsen this response. The skin may look normal despite intense itching. Cooler water and medical treatments can help, so mention this symptom at follow-up.

Are there foods I should avoid?

There is no specific PV diet. A balanced eating pattern that supports heart and blood vessel health is reasonable. Avoid starting iron supplements unless your hematology team recommends them. If you take aspirin or another medicine affecting clotting, ask before using supplements that may increase bleeding.

Can polycythemia vera turn into leukemia?

It can, but this is uncommon. PV may also progress to post-PV myelofibrosis, which causes scarring in the bone marrow. Changes in blood counts, spleen size, or symptoms may lead to further tests.

Can blood removed during phlebotomy be donated?

Therapeutic phlebotomy is performed as medical treatment, not automatically as a standard blood donation. Whether the blood can be used depends on local blood-service rules and collection arrangements.

Sources

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