

Pernicious anemia

Pernicious anemia is a decrease in red blood cells that occurs when the body cannot properly absorb vitamin B12 from the gastrointestinal tract. Vitamin B12 is necessary for the proper development of red blood cells.

Causes :

The body needs vitamin B12 to make red blood cells. To absorb vitamin B12, body uses a special protein called intrinsic factor, which is released by cells in the stomach. The combination of vitamin B12 bound to intrinsic factor is absorbed in the last part of the small intestine.

When the stomach does not make enough intrinsic factor, the intestine cannot properly absorb vitamin B12.

Very rarely, infants and children are born without the ability to produce enough intrinsic factor, or the ability to absorb the combination of intrinsic factor and vitamin B12 in the small intestine. Pernicious anemia that occurs at birth (congenital) is inherited.

Common causes of pernicious anemia include:

1. Weakened stomach lining (atrophic gastritis)
2. The body's immune system attacking the cells that make intrinsic factor (autoimmunity against gastric parietal cells) or intrinsic factor itself.

The disease begins slowly and may take decades to fully establish. Although the congenital form occurs in children, pernicious anemia usually does not appear before age 30 in adults. The average age at diagnosis is 60 , and the incidence is slightly higher in women than in men.

Many signs and symptoms are recognized to PA:

1. Fatigue, low blood pressure, rapid heart rate, high blood pressure, pallor, depression, muscle weakness, and shortness of breath .
2. Difficulty in proprioception .
3. Mild difficulty concentrating and sluggish responses .
4. Neuropathic pain .
5. Frequent diarrhea .
6. Paresthesias, such as pins and needles sensations or lack of feeling in fingers or toes, due to B₁₂ deficiency affecting nerve function
7. Jaundice due to impaired formation of blood cells
8. Glossitis (swollen red tongue) due to B₁₂ deficiency
9. May present with hyperthyroidism or hypothyroidism.

10. Personality or memory changes including irritability and depression .
11. Dehydrated /cracked and pale lips and dark circles around the eyes.

Diagnosis :

The dangerous nature of the disease may mean a diagnosis is delayed. PA is suspected when the patient's blood smear shows large, fragile, immature erythrocytes (megaloblasts).

IF antibodies are highly suggestive for a diagnosis of PA, and are found in nearly 100% of patients, with a sensitivity of around 70%. Anti-parietal cell antibodies are inferior to intrinsic factor antibodies, as they are less sensitive and less specific.

The Schilling test is the classic test for PA, but it is no longer widely used, as there are other quicker and easier methods (in addition to difficulties with the radiolabelled agent). The other main diagnostic signpost of low levels of serum B₁₂ cannot be relied upon, as sufferers can have high levels of serum B₁₂ and still have pernicious anemia.

Blood and urine tests for methylmalonic acid may indicate a B₁₂ deficiency, even though serum B₁₂ is within the normally acceptable range. Serum B₁₂ is not necessarily an indicator of efficient use by the body, in the muscles, for example.

A diagnosis of PA first requires demonstration of megaloblastic anemia (through a full blood count), which evaluates the mean corpuscular volume (MCV), as well the mean corpuscular hemoglobin concentration (MCHC). Pernicious anemia is identified with a high MCV and a normal MCHC (that is, it is a macrocytic, normochromic anemia). Ovalocytes are also typically seen on the blood smear.

Pernicious anemia can also be diagnosed by evaluating its direct cause, vitamin B₁₂ deficiency, by measuring B₁₂ levels in serum. A Schilling test can then be used to distinguish pernicious anemia from other causes of B₁₂ deficiency (notably malabsorption).

The diagnosis of atrophic gastritis type A should be confirmed by gastroscopy and stepwise biopsy.

Aplastic anemia

Aplastic anemia is a blood disorder that occurs when the bone marrow produces too few of all types of blood cells: red cells, white and platelets (**Pancytopenia**).

- ❖ A low number of red blood cells reduces the blood's ability to carry oxygen.
- ❖ A reduced number of white blood cells makes the child more susceptible to infection.
- ❖ A low number of platelets reduces the blood's ability to clot.

Causes :

A / Primary :

- 1 - **Idiopathic** : occurring with no known reason. The disorder can be the result of a previous illness or presented problem.
- 2 - **Inherited genetic disorder.**

B / Secondary : (Acquired causes)

1. **Specific infectious diseases**, such as hepatitis, Epstein-Barr virus, or cytomegalovirus
2. taking certain medications including some antibiotics and arthritis drugs
3. exposure to certain toxins, such as benzene, TNT , Hair dyes , Chlordane , and DDT.
4. exposure to radiation or chemotherapy .

Symptoms:

1. lack of energy or tiring easily
2. pale skin, lips, and hands, or paleness under the eyelids
3. shortness of breath
4. fevers or infections
5. bleeding, such as bruising, bleeding gums, nosebleeds or blood in the stool
6. irregular heartbeat
7. headache.

Laboratory Tests :

The initial test for anemia, the complete blood count (CBC), may reveal many abnormal results.

1. Hemoglobin and/or hematocrit may be low.
2. RBC and WBC counts are low.
3. Platelet count is low.
4. Red blood cell indices are usually normal.

5. The differential white blood count shows a decrease in most types of cells but not lymphocytes

Some additional tests that may be performed to help determine the type and cause of anemia include:

1. Reticulocyte count—result is usually low.
2. Bleeding time is increased .
3. Erythropoietin—usually increased in aplastic anemia.
4. A bone marrow aspiration will show a decrease in the number of all types of mature cells.
5. Tests for infections such as hepatitis, EBV, CMV help to determine the cause.
6. Test for arsenic (a heavy metal) and other toxins .
7. exposure to toxins or certain drugs (for example, chloramphenicol) or prior treatment for cancer.