

Vitamin B12-deficiency anaemia

Anaemia is a condition in which the blood cannot carry enough oxygen, either because there is a low number of red blood cells or because each red blood cell is less able to carry oxygen than normal.

There are many different types of anaemia with different causes. Vitamin B12 deficiency is a possible cause.

Symptoms of anaemia include feeling tired or faint and getting breathless easily.

About blood

Blood is made up of fluid called plasma which contains three types of cells:

- white blood cells – these are part of the immune system, the body's defence against infection
- platelets – these are involved in blood clotting
- red blood cells – these carry oxygen around the body in a pigment called haemoglobin

Red blood cells are made by the body in the bone marrow, and live for around four months before they are destroyed and replaced, as part of a normal renewal process.

Anaemia due to lack of vitamin B12

Anaemia is a condition in which the blood cannot carry enough oxygen to meet the body's needs. This may be because there are less red blood cells than normal, or because there is not enough haemoglobin in each cell.

Vitamin B12 is needed to make red blood cells. Vitamin B12 is also essential for the nerves and brain.

Other nutrients that are needed to make red blood cells include iron and folate (folic acid). A lack of these in the diet can also cause anaemia. For more information please see the separate BUPA factsheets on Iron-deficiency anaemia and Folate-deficiency anaemia.

Causes of vitamin B12 deficiency

Pernicious anaemia

In most cases, vitamin B12 deficiency happens because the stomach cannot produce enough of a substance called intrinsic factor (IF), which is needed for vitamin B12 to be absorbed. This is called pernicious anaemia.

Pernicious anaemia is an autoimmune condition. Normally cells called antibodies, produced by the body's immune system, attack foreign substances such as viruses and bacteria. With autoimmune conditions, the immune system mistakes the person's own tissue as foreign and attacks it.

With pernicious anaemia, antibodies damage the cells in the stomach that produce intrinsic factor.

The cause of pernicious anaemia is not known. It usually develops in people over the age of 50, and tends to run in families. If left untreated, pernicious anaemia can become life-threatening.

Other causes of B12 deficiency

- Poor absorption of vitamin B12 can be caused by parasites or certain bacteria that interfere with absorption in the small intestine. Crohn's disease (a condition of the small bowel) can also interfere with vitamin B12 absorption.
- Vitamin B12 deficiency can be associated with a poorly functioning pancreas; liver damage, caused by excess alcohol intake; gastrectomy (surgical removal of part or all of the stomach); and taking some medications for stomach ulcers on a long-term basis.
- Dietary-related vitamin B12 deficiency is rare, but strict vegans may be at risk because their diet excludes the foods that provide this vitamin. Vitamin B12 is the only vitamin that is not found in vegetables.

Symptoms

People with vitamin B12-deficiency anaemia have symptoms caused by a low level of oxygen in the body. These include:

- breathlessness
- tiredness
- dizziness
- rapid, weak pulse rate
- palpitations – irregular or strong heartbeats
- headaches
- pale skin

As well as the symptoms of anaemia, vitamin B12 deficiency may cause neurological symptoms such as inflammation of the nerves (neuritis) which can affect movement and sensation, tinnitus (ringing in the ears), colour blindness, lightheadedness, confusion, depression, poor concentration and forgetfulness. There may also be loss of appetite, diarrhoea and weight loss.

Diagnosis

Anyone with symptoms that suggest anaemia, such as pale skin, weakness and fatigue, should visit their GP. He or she will ask about your symptoms, medical history and current eating habits, and perform a physical examination.

A simple blood test can count the number of red blood cells and measure the amount of haemoglobin.

The size of the red blood cells will also be examined. Enlarged red cells, called megaloblasts, are caused by vitamin B12 deficiency and folate deficiency. If they are present the condition is called megaloblastic anaemia. Finding megaloblasts in the blood can help to diagnose anaemia but does not determine the cause.

The level of vitamin B12 can be measured with a blood test, if necessary.

The GP may recommend further tests to identify the cause of B12 deficiency. One test looks at how well vitamin B12 is absorbed by the body. This involves fasting overnight and then having a vitamin B12 injection and taking radioactive-labelled vitamin B12 tablets. The amount of vitamin B12 that comes out in the urine is measured. This is called the Schilling test.

The antibodies which cause pernicious anaemia can also be tested for. A blood test can also identify coeliac disease or blood conditions such as thalassaemia.

Treating vitamin B12 deficiency

Treatment for vitamin B12 deficiency anaemia is usually injections of vitamin B12. The frequency of injection depends on the exact type and severity of the anaemia, but is usually every one to three months, after an initial two weeks of more frequent injections. Vitamin B12 injections sometimes cause bruising and soreness.

In severe cases of B12-deficiency anaemia, a blood transfusion may be required.

If the deficiency is caused by low dietary intake, vitamin B12 tablets may be taken.

Prevention

The best way to prevent B12-deficiency anaemia is to eat a diet containing plenty of vitamin B12. The daily recommended intake for an adult is 1.5µg (1.5 micrograms) a day.

Vitamin B12 is found in meat and animal products, particularly liver, salmon, cod, cheese and eggs. The following is a list of the amount of vitamin B12 contained in 100g of these foods:

- calf liver (fried) – 58 micrograms
- cheddar cheese – 2.4 micrograms
- salmon (grilled) – 5 micrograms
- steak – 2 micrograms

Strict vegetarians should consider taking a regular vitamin B12 supplement to prevent anaemia. Anyone who is worried about vitamin B12 intake should speak to a GP or dietician.