Vitamin B12 or folate deficiency anaemia

Overview

Vitamin B12 or B9 (commonly called folate) deficiency anaemia occurs when a lack of vitamin B12 or folate causes the body to produce abnormally large red blood cells that cannot function properly.

Red blood cells carry oxygen around the body using a substance called haemoglobin.

Anaemia is the general term for having either fewer red blood cells than normal or having an abnormally low amount of haemoglobin in each red blood cell.

Symptoms of vitamin B12 or folate deficiency

Vitamin B12 and folate perform several important functions in the body, including keeping the nervous system healthy.

A deficiency in either of these vitamins can cause a wide range of problems, including:

- extreme tiredness
- a lack of energy
- pins and needles
- a sore and red tongue
- mouth ulcers
- muscle weakness
- problems with your vision
- psychological problems, which can range from mild depression or anxiety to confusion and dementia
- problems with memory, understanding and judgement

Some of these problems can also happen if you have a deficiency in vitamin B12 or folate but do not have anaemia.

When to see a GP

See a GP if you think you may have a vitamin B12 or folate deficiency.

These conditions can often be diagnosed based on your symptoms and the results of a blood test.

It's important for vitamin B12 or folate deficiency anaemia to be diagnosed and treated as soon as possible.

This is because although many of the symptoms improve with treatment, some problems caused by the condition can be irreversible.

Causes of a vitamin B12 or folate deficiency

There are a number of problems that can lead to a vitamin B12 or folate deficiency.

These include:

- pernicious anaemia – where your immune system attacks healthy cells in your stomach, preventing your body absorbing vitamin B12 from the food you eat; this is the most common cause of vitamin B12 deficiency in the UK
- a lack of these vitamins in your diet – this is uncommon, but can happen if you have a vegan diet and do not take vitamin B12 supplements or eat foods fortified with vitamin B12 , follow a restrictive diet or have a generally poor diet for a long time
- medicine – certain medicines, including anticonvulsants and proton pump inhibitors (PPIs), can affect how much of these vitamins your body absorbs

Both vitamin B12 deficiency and folate deficiency are more common in older people, affecting around 1 in 10 people aged 75 or over and 1 in 20 people aged 65 to 74.

Treating vitamin B12 or folate deficiency anaemia

Most cases of vitamin B12 and folate deficiency can be easily treated with injections or tablets to replace the missing vitamins.

Vitamin B12 supplements are usually given by injection at first.

Then, depending on whether your B12 deficiency is related to your diet, you'll either require B12 tablets between meals or regular injections.

Treatments may last until your vitamin B12 levels have improved or you may need treatment for the rest of your life.

Folic acid tablets are used to restore folate levels. These usually need to be taken for 4 months.

In some cases, improving your diet can help treat the condition and prevent it coming back.

Vitamin B12 is found in meat, fish, eggs, dairy products and specially fortified foods.

Good sources of folate include green vegetables, such as broccoli, brussels sprouts and peas.

Complications of vitamin B12 or folate deficiency anaemia

Although it's uncommon, vitamin B12 or folate deficiency (with or without anaemia) can lead to complications, particularly if you have been deficient in vitamin B12 or folate for some time.

Potential complications can include:

- problems with the nervous system
- temporary infertility
- heart conditions
- pregnancy complications and birth defects

Adults with severe anaemia are also at risk of developing heart failure.

Some complications improve with appropriate treatment, but others, such as problems with the nervous system, can sometimes be permanent.

Symptoms

Vitamin B12 or folate deficiency anaemia can cause a wide range of symptoms. These usually develop gradually, but can worsen if the condition goes untreated.

Most symptoms are the same whether they are caused by either folate deficiency or vitamin B12 deficiency.

Symptoms of vitamin B12 and folate deficiency anaemia include:

- rapid breathing or shortness of breath
- headaches
- indigestion
- loss of appetite
- palpitations
- problems with your vision
- feeling weak or tired
- diarrhoea
- a sore or red tongue, sometimes with mouth ulcers
- problems with memory, understanding and judgment (cognitive changes)

Some of these symptoms can also happen in people who have a vitamin B12 or folate deficiency but have not developed anaemia.

Vitamin B12 deficiency can also cause symptoms that affect your brain and nervous system (neurological symptoms), including:

- numbness
- muscle weakness
- psychological problems, which can range from mild depression or anxiety, to confusion and dementia
- problems with balance and coordination
- pins and needles
- incontinence

When to see a GP

See a GP if you're experiencing symptoms of vitamin B12 or folate deficiency anaemia.

These conditions can often be diagnosed based on your symptoms and the results of a blood test.

It's important for vitamin B12 or folate deficiency anaemia to be diagnosed and treated as soon as possible.

Although many of the symptoms improve with treatment, some problems caused by the condition can be irreversible if left untreated.

The longer the condition goes untreated, the higher the chance of permanent damage.

Causes

Vitamin B12 or folate deficiency anaemia occurs when a lack of either of these vitamins affects the body's ability to produce fully functioning red blood cells.

Red blood cells carry oxygen around the body. Most people with vitamin B12 or folate deficiency anaemia have underdeveloped red blood cells that are larger than normal. The medical term for this is megaloblastic anaemia.

A vitamin B12 or folate deficiency can be the result of a variety of problems.

Causes of vitamin B12 deficiency

Pernicious anaemia

Pernicious anaemia is the most common cause of vitamin B12 deficiency in the UK.

Pernicious anaemia is an autoimmune condition that affects your stomach.

An autoimmune condition means your immune system, the body's natural defence system that protects against illness and infection, attacks your body's healthy cells.

Vitamin B12 is combined with a protein called intrinsic factor in your stomach. This mix of vitamin B12 and intrinsic factor is then absorbed into the body in part of the gut called the distal ileum.

Pernicious anaemia causes your immune system to attack the cells in your stomach that produce the intrinsic factor, which means your body is unable to absorb vitamin B12.

The exact cause of pernicious anaemia is unknown, but it's more common in women around 60 years of age, people with a family history of the condition and those with another autoimmune condition, such as Addison's disease or vitiligo.

Diet

Some people can develop a vitamin B12 deficiency as a result of not getting enough vitamin B12 from their diet.

A diet that includes meat, fish and dairy products usually provides enough vitamin B12, but people who do not regularly eat these foods can become deficient.

People who eat a vegan diet and do not take vitamin B12 supplements or eat foods fortified with vitamin B12, are also at risk.

Stores of vitamin B12 in the body can last around 2 to 5 years without being replenished, so it can take a long time for any problems to develop after a dietary change.

Conditions affecting the stomach

Some stomach conditions or stomach operations can prevent the absorption of enough vitamin B12.

For example, a gastrectomy, a surgical procedure where part of your stomach is removed, increases your risk of developing a vitamin B12 deficiency.

Conditions affecting the intestines

Some conditions that affect your intestines can also stop you absorbing the necessary amount of vitamin B12.

For example, Crohn's disease, a long-term condition that causes inflammation of the lining of the digestive system, can sometimes mean your body does not get enough vitamin B12.

Medicines

Some types of medicine can lead to a reduction in the amount of vitamin B12 in your body.

Examples include:

- proton pump inhibitors (PPIs)
- metformin
- nitrous oxide

Your GP will be aware of medicines that can affect your vitamin B12 levels and will monitor you if necessary.

Functional vitamin B12 deficiency

Some people can experience problems related to a vitamin B12 deficiency, despite appearing to have normal levels of vitamin B12 in their blood.

This can happen as the result of a problem known as functional vitamin B12 deficiency, where there's a problem with the proteins that help transport vitamin B12 between cells.

This results in neurological complications involving the spinal cord.

Causes of folate deficiency

Folate dissolves in water, which means your body is unable to store it for long periods of time.

Your body's store of folate is usually enough to last 4 months. This means you need folate in your daily diet to ensure your body has sufficient stores of the vitamin.

Like vitamin B12 deficiency anaemia, folate deficiency anaemia can develop for a number of reasons.

Diet

Good sources of folate include broccoli, Brussels sprouts, asparagus, peas, chickpeas and brown rice.

If you do not regularly eat these types of foods, you may develop a folate deficiency.

Folate deficiency caused by a lack of dietary folate is more common in people who have a generally unbalanced and unhealthy diet, people who regularly misuse alcohol, and people following a restrictive diet that does not involve eating good sources of folate.

Malabsorption

Sometimes your body may be unable to absorb folate as effectively as it should. This is usually caused by an underlying condition affecting your digestive system, such as coeliac disease.

Excessive peeing

You may lose folate from your body if you pee frequently.

This can be caused by an underlying condition that affects one of your organs, such as:

- congestive heart failure – where the heart is unable to pump enough blood around the body
- acute liver damage – often caused by drinking excessive amounts of alcohol

- long-term dialysis – where a machine that replicates the kidney function is used to filter waste products from the blood

Medicine

Some types of medicines reduce the amount of folate in your body or make the folate harder to absorb.

These include some anticonvulsants (medicines used to treat epilepsy), colestyramine, sulfasalazine and methotrexate.

Your GP will be aware of medicines that can affect your folate levels and will monitor you if necessary.

Other causes

Your body sometimes requires more folate than normal. This can cause folate deficiency if you cannot meet your body's demands for the vitamin.

Your body may need more folate than usual if you:

- are pregnant – read more about complications of folate deficiency in pregnancy
- have cancer
- have a blood disorder – such as sickle cell anaemia, an inherited blood disorder that causes red blood cells to develop abnormally
- are fighting an infection or health condition that causes inflammation (redness and swelling)

Premature babies (born before the 37th week of pregnancy) are also more likely to develop a folate deficiency because their developing bodies require higher amounts of folate than normal.

Diagnosis

A diagnosis of vitamin B12 or folate deficiency anaemia can often be made by a GP based on your symptoms and the results of blood tests.

Blood tests

Different types of blood tests can be carried out to help identify people with a possible vitamin B12 or folate deficiency.

These tests check:

- whether you have a lower level of haemoglobin (a substance that transports oxygen) than normal

- whether your red blood cells are larger than normal
- the level of vitamin B12 in your blood
- the level of folate in your blood

It's also important for your symptoms to be taken into account when a diagnosis is made.

Some people can have symptoms and also seem to have normal levels of these vitamins. And some people may have low levels despite having no symptoms.

Identifying the cause

If your symptoms and blood test results suggest a vitamin B12 or folate deficiency, your GP may arrange further tests.

If the cause can be identified, it'll help to determine the most appropriate treatment.

For example, you may have additional blood tests to check for a condition called pernicious anaemia.

This is an autoimmune condition, where your immune system produces antibodies to attack healthy cells, which means you're unable to absorb vitamin B12 from the food you eat.

Tests for pernicious anaemia are not always conclusive, but can often give your GP a good idea of whether you have the condition.

Referral to a specialist

You may be referred to a specialist for further tests or treatment.

This may include:

- a specialist in treating blood conditions (a haematologist) – if you have vitamin B12 or folate deficiency anaemia and your GP is uncertain of the cause, you're pregnant or symptoms suggest your nervous system has been affected
- a specialist in conditions that affect the digestive system (a gastroenterologist) – if your GP suspects you do not have enough vitamin B12 or folate because your digestive system is not absorbing it properly
- a specialist in nutrition (a dietitian) – if your GP suspects you have a vitamin B12 or folate deficiency caused by a poor diet

A dietitian can devise a personalised eating plan for you to increase the amount of vitamin B12 or folate in your diet.

Find out more about B vitamins and folic acid for information about good sources of these vitamins.

Treatment

The treatment for vitamin B12 or folate deficiency anaemia depends on what's causing the condition. Most people can be easily treated with injections or tablets to replace the missing vitamins.

Treating vitamin B12 deficiency anaemia

Vitamin B12 deficiency anaemia is usually treated with injections of vitamin B12, called hydroxocobalamin.

At first, you'll have these injections every other day for 2 weeks or until your symptoms have started improving.

Your GP or nurse will give the injections.

After this initial period, your treatment will depend on whether the cause of your vitamin B12 deficiency is related to your diet or whether the deficiency is causing any neurological problems, such as problems with thinking, memory and behaviour.

The most common cause of vitamin B12 deficiency in the UK is pernicious anaemia, which is not related to your diet.

Diet-related

If your vitamin B12 deficiency is caused by a lack of the vitamin in your diet, you may be advised to take vitamin B12 tablets every day between meals.

Or you may need to have an injection of hydroxocobalamin twice a year.

People who find it difficult to get enough vitamin B12 in their diets, such as those following a vegan diet, may need vitamin B12 tablets for life.

Although it's less common, people with vitamin B12 deficiency caused by a prolonged poor diet may be advised to stop taking the tablets once their vitamin B12 levels have returned to normal and their diet has improved.

Good sources of vitamin B12 include:

- meat
- salmon and cod
- milk and other dairy products
- eggs

If you're a vegetarian or vegan, or are looking for alternatives to meat and dairy products, there are foods that are fortified with vitamin B12, such as some yeast extracts, breakfast cereals and soy products.

Check the nutrition labels while food shopping to see how much vitamin B12 different foods contain.

Not diet-related

If your vitamin B12 deficiency is not caused by a lack of vitamin B12 in your diet, you'll usually need to have an injection of hydroxocobalamin every 2 to 3 months for the rest of your life.

If you have had neurological symptoms that affect your nervous system, such as numbness or tingling in your hands and feet, caused by a vitamin B12 deficiency, you'll be referred to a haematologist and may need to have injections every 2 months.

Your haematologist will advise on how long you need to keep taking the injections.

For injections of vitamin B12 given in the UK, hydroxocobalamin is preferred to an alternative called cyanocobalamin. This is because hydroxocobalamin stays in the body for longer.

Treating folate deficiency anaemia

To treat folate deficiency anaemia, your GP will usually prescribe daily folic acid tablets to build up your folate levels.

They may also give you dietary advice so you can increase your folate intake.

Good sources of folate include:

- broccoli
- brussels sprouts
- asparagus
- peas
- chickpeas
- brown rice

Most people need to take folic acid tablets for about 4 months. But if the underlying cause of your folate deficiency anaemia continues, you may have to take folic acid tablets for longer, possibly for life.

Before you start taking folic acid, your GP will check your vitamin B12 levels to make sure they're normal.

This is because folic acid treatment can sometimes improve your symptoms so much that it masks an underlying vitamin B12 deficiency.

If a vitamin B12 deficiency is not detected and treated, it could affect your nervous system.

Monitoring your condition

To ensure your treatment is working, you may need to have further blood tests.

A blood test is often carried out around 7 to 10 days after starting treatment to assess whether treatment is working.

This is to check your haemoglobin level and the number of the immature red blood cells (reticulocytes) in your blood.

Another blood test may also be carried out after approximately 8 weeks to confirm your treatment has been successful.

Most people who have had a vitamin B12 or folate deficiency will not need further monitoring unless their symptoms return or their treatment is ineffective.

Complications

As most cases of vitamin B12 deficiency or folate deficiency can be easily and effectively treated, complications are rare.

But complications can occasionally develop, particularly if you have been deficient in either vitamin for some time.

Anaemia complications

All types of anaemia, regardless of the cause, can lead to heart and lung complications as the heart struggles to pump oxygen to the vital organs.

Adults with severe anaemia are at risk of developing:

- an abnormally fast heartbeat (tachycardia)
- heart failure, where the heart fails to pump enough blood around the body at the right pressure

Complications of vitamin B12 deficiency

A lack of vitamin B12 (with or without anaemia) can cause complications.

Neurological changes

A lack of vitamin B12 can cause neurological problems, which affect your nervous system, such as:

- vision problems
- memory loss
- pins and needles
- loss of physical co-ordination (ataxia), which can affect your whole body and cause difficulty speaking or walking

- damage to parts of the nervous system (peripheral neuropathy), particularly in the legs

If neurological problems do develop, they can sometimes be irreversible.

Infertility

Vitamin B12 deficiency can sometimes lead to temporary infertility, an inability to conceive.

This usually improves with appropriate vitamin B12 treatment.

Stomach cancer

If you have a vitamin B12 deficiency caused by pernicious anaemia, a condition where your immune system attacks healthy cells in your stomach, your risk of developing stomach cancer is increased.

Neural tube defects

If you're pregnant, not having enough vitamin B12 can increase the risk of your baby developing a serious birth defect known as a neural tube defect.

The neural tube is a narrow channel that eventually forms the brain and spinal cord.

Examples of neural tube defects include:

- spina bifida – where the baby's spine does not develop properly
- anencephaly – where a baby is born without parts of the brain and skull
- encephalocele – where a membrane or skin-covered sac containing part of the brain pushes out of a hole in the skull

Find out how you can reduce the risk of your baby developing a neural tube defect

Effects of nitrous oxide

Nitrous oxide, commonly known as ‘gas and air’, is a type of anaesthetic used in dental treatments and childbirth. Using nitrous oxide can reduce the levels of vitamin B12 in your body. If you are pregnant and have B12 deficiency, discuss with your doctor or midwife whether you will be able to use gas and air during labour.

Complications of folate deficiency

A lack of folate (with or without anaemia) can also cause complications.

Infertility

As with a lack of vitamin B12, a folate deficiency can also affect your fertility.

But this is only temporary and can usually be reversed with folate supplements.

Cardiovascular disease

Research has shown a lack of folate in your body may increase your risk of cardiovascular disease (CVD).

CVD is a general term that describes a disease of the heart or blood vessels, such as coronary heart disease.

Cancer

Research has shown that folate deficiency can increase your risk of some cancers, such as colon cancer.

Problems in childbirth

A lack of folate during pregnancy may increase the risk of the baby being born prematurely (before the 37th week of pregnancy) or having a low birth weight.

The risk of placental abruption may also be increased. This is a serious condition where the placenta starts to come away from the inside of the womb wall, causing stomach ache and bleeding from the vagina.

Neural tube defects and folic acid

As with a vitamin B12 deficiency, a lack of folate can also affect an unborn baby's growth and development in the womb (uterus).

This increases the risk of neural tube defects, such as spina bifida, developing in the unborn baby.

It's recommended that all women who could get pregnant should take a daily supplement of folic acid.

You should take a 400 microgram supplement of folic acid every day before you get pregnant, and up until you're 12 weeks pregnant.

This will ensure that both you and your baby have enough folate and help your baby grow and develop.

Folic acid tablets are available with a prescription from a GP, or you can buy them from pharmacies, large supermarkets and health food stores.

If you're pregnant and have another condition that may increase your body's need for folate, your GP will monitor you closely to prevent you becoming anaemic.

In some cases, you may need a higher dose of folic acid. For example, if you have diabetes, you should take a 5 milligrams (5mg) supplement of folic acid instead of the standard 400 micrograms.

Your GP can prescribe a higher dose of folic acid.

Find out more about vitamins and nutrition in pregnancy

Source: https://www.nhs.uk/conditions/vitamin-b12-or-folate-deficiency-anaemia/