Anaemia

Anaemia means that there is too little haemoglobin (the protein that carries oxygen) or too few red cells in the blood. Many people with lymphoma are affected by anaemia at some point during their illness, either because of the lymphoma itself or as a side effect of the treatment they are having. Anaemia can make people feel tired or short of breath.

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What is anaemia?

Anaemia is a shortage of haemoglobin and red blood cells. If you have anaemia, doctors say that you are ‘anaemic’.

Haemoglobin is a protein found in red blood cells. It carries oxygen from the lungs to the rest of the body. Red blood cells are made in the bone marrow (the spongy centre of some bones). They normally work for about 3 months before they wear out and are broken down in the spleen, liver and bone marrow. The bone marrow works all the time to make new red blood cells from ‘recycled’ components of the old cells.

Figure: Red blood cells
Why is haemoglobin important?

Haemoglobin is a protein that carries oxygen around your body.

When red blood cells in your bloodstream pass through your lungs, the haemoglobin in them picks up oxygen. These red blood cells then travel in your bloodstream all around the rest of your body. As they do so, the haemoglobin inside them releases its oxygen to the organs that need it.

If you have fewer red blood cells than normal in your bloodstream, you also have less haemoglobin. This means that less oxygen can be carried around your body to the organs that need it. It is important that all the organs and tissues in your body get enough oxygen – they cannot work properly without it.

How much haemoglobin should you have?

The amount of haemoglobin (and the number of red cells) in your blood is measured by a test called the full blood count (FBC). Doctors talk about a ‘range’ of normal results because some people naturally have higher or lower levels than other people. Men usually have more haemoglobin than women, so there are different ranges for men and women.

A normal haemoglobin level for adults is around 115 to 180 grams per litre of blood (g/L). It varies according to a person’s age, sex and ethnic origin.

Different hospitals use slightly different ranges when deciding if a person is anaemic. In general, haemoglobin should be:

- above 135 g/L for a man
- above 115 g/L for a woman.

These values used to be given as 13.5 g/dL and 11.5 g/dL (grams of haemoglobin per 100 millilitres of blood, instead of per litre).
What causes anaemia in people with lymphoma?

Possible causes of anaemia in people with lymphoma are:

- lymphoma in the bone marrow
- some lymphoma treatments
- red blood cells being destroyed by an antibody that attacks them (this is known as 'autoimmune haemolytic anaemia')
- other causes, some that are related to the lymphoma and its treatment, and others that are nothing to do with lymphoma.

**Lymphoma in the bone marrow**

If lymphoma cells are in the bone marrow, they take up space that is normally used to make healthy blood cells. This can lower the number of red blood cells your bone marrow makes, so you have less haemoglobin and develop anaemia.

Anaemia caused by lymphoma in the bone marrow often begins to improve once treatment for the lymphoma has started to work and the number of lymphoma cells decreases.

**Lymphoma treatments**

The aim of lymphoma treatment is to kill the lymphoma cells, but a side effect of many types of chemotherapy and radiotherapy is that some healthy cells are also destroyed. This can include blood cells that are developing in the bone marrow.

Chemotherapy doesn’t cause anaemia straightaway. Red blood cells live for 3 months, so there are still many cells in your blood when treatment starts. As the treatment goes on, the existing cells start to wear out but there are not enough new cells being made to replace them. This means there is less haemoglobin in the blood and anaemia can develop. This might become a problem depending on:

- how strong your chemotherapy is
- whether you had lymphoma in the bone marrow before you started treatment
- whether you have additional problems (for example, infection).

Radiotherapy can also cause anaemia, especially radiotherapy to the chest, abdomen (tummy), pelvis or the legs.
Autoimmune haemolytic anaemia

Sometimes, lymphoma can cause your immune system to make antibodies against your own cells. These antibodies are known as ‘autoantibodies’.

If the autoantibodies stick to red blood cells, the cells are removed as they pass through the spleen. If the bone marrow can’t make new red cells fast enough to replace the ones that are removed, anaemia develops. This type of anaemia is known as ‘autoimmune haemolytic anaemia’ (AIHA). It happens more often in people with low-grade lymphomas, such as chronic lymphocytic leukaemia (CLL).

Other causes

There are other ways that lymphoma and its treatment can cause anaemia, including:

- bleeding, which might happen if you have lymphoma in the bowel, or if you have low platelets (thrombocytopenia)
- a lack of certain vitamins and minerals, which may happen if you are not eating well
- anaemia of chronic disease, which is when the bone marrow makes new cells more slowly because of an infection or inflammation that’s been in the body for a long time.

Symptoms of anaemia

Many people with a haemoglobin level below normal do not notice anything different. This is because the body usually has much more haemoglobin than you need for day-to-day life. If your haemoglobin is only slightly low, you can tolerate your anaemia.

As the amount of haemoglobin falls, the organs of the body receive less oxygen. Symptoms start to occur if parts of the body do not get enough oxygen.

Symptoms of anaemia include:

- fatigue (extreme tiredness)
- feeling weak and lethargic (lacking energy)
- feeling short of breath when doing things
- feeling your heart fluttering or pounding (palpitations)
- feeling dizzy or faint
- headache
- sometimes aching bones.
If you have anaemia, you might look paler than is normal for you. This might be more noticeable on the insides of your eyelids.

People vary in how much anaemia they can tolerate. How you feel depends on:

- your age
- your fitness
- whether or not you have any other conditions, such as heart disease.

The draining effects of lymphoma and its treatment might make you less able to tolerate anaemia. This means you might notice symptoms of milder anaemia (less of a fall in your haemoglobin) more than you would have done otherwise. Anaemia can also make you less able to tolerate the effects of your treatment. If you get an infection or fever, your anaemia could worsen and you might feel the effects of it more.

Let your medical team know if you have any symptoms of anaemia. They might suggest you have a **blood test** to check your haemoglobin level. Many of these symptoms can also be caused by problems other than anaemia. If your symptoms are due to anaemia, your doctor should talk to you about possible treatments.

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**Treatment for anaemia**

Treatment for anaemia depends on what is causing it. Often there is more than one cause. You might need more blood tests to find the reason for your low haemoglobin level. Sometimes the cause is easy to treat and has nothing to do with your lymphoma. For example, haemoglobin is made from iron. If your anaemia is caused by low iron levels, you might need an iron tablet to supplement your diet, or sometimes intravenous iron (iron given through an injection into your veins). Your doctor will tell you if this is the case. Always check with your medical team before taking any medicines or supplements that haven’t been prescribed for you.

If your anaemia is caused by loss of blood, you may have other tests to look for the source of the bleeding.

If your anaemia is caused by your bone marrow not making enough red blood cells, you’ll need treatment. You might be given a blood transfusion or erythropoietin (EPO) injections to boost your bone marrow.

These treatments don’t work well for autoimmune haemolytic anaemia. Treatment for autoimmune haemolytic anaemia is usually **steroids**.
Blood transfusion

If your anaemia is causing you serious symptoms, or your haemoglobin level is less than 70 g/L, you might need a **blood transfusion**. Your doctor will explain how this might help you and any risks that are involved.

Usually a transfusion will make you feel better for a few weeks. Afterwards, if your bone marrow still isn't producing enough red blood cells, you may begin to get symptoms again. This is because, just like your own cells, the transfused red cells are removed from your blood as they age.

**Erythropoietin (EPO)**

Erythropoietin (EPO) is a hormone (a chemical messenger) that occurs naturally in your body. It is made by the kidneys and tells the bone marrow to make more red blood cells. Man-made versions are also available as a medicine.

EPO is recommended for people with cancer who are being treated with chemotherapy and who have haemoglobin levels lower than 100 g/L. It increases your haemoglobin level and can reduce the number of blood transfusions you need.

EPO is given as a subcutaneous injection (an injection into the fatty tissue just under your skin, often in the tummy, thigh or upper arm). If you need EPO, you usually have it for the whole time you’re on chemotherapy and sometimes for a few weeks afterwards. You might need it once a week or several times a week.

EPO is not suitable for everyone because it can cause side effects, which include:

- raised blood pressure (hypertension)
- an increased risk of blood clots.

Other side effects include:

- nausea
- diarrhoea
- fever
- rash
- headache.
Treatments for autoimmune haemolytic anaemia

If your anaemia is caused by autoantibodies destroying your red cells, blood transfusions usually do not help. Instead, the treatment for this type of anaemia aims to reduce the number of autoantibodies being made.

This is usually done by giving you treatment with steroids, often prednisolone. The dose of steroid is high to begin with, which may cause irritation to your stomach. You might be given another drug to protect your stomach. Once your anaemia is under control, the dose of steroid is lowered.

Steroids are effective for most people who have autoimmune haemolytic anaemia. If steroids aren’t effective, other possible treatments include splenectomy (having your spleen removed), antibody treatment with rituximab, or treatment with drugs that dampen the immune system (immunosuppressants).

References

The full list of references for this page is available on our website. Alternatively, email publications@lymphoma-action.org.uk or call 01296 619409 if you would like a copy.

Acknowledgements

- With thanks to Dr Prem Mahendra, Consultant Haemato-Oncologist, Queen Elizabeth Hospital, University of Birmingham NHS Foundation Trust, for reviewing this information.
- We would like to thank the members of our Reader Panel who gave their time to review this information.
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