

# Neutropenia and myeloma

**This Infosheet explains the causes of neutropenia in myeloma patients, what the symptoms are and how it is managed.**

## What is neutropenia?

Neutropenia is a condition in which there are a lower than normal number of neutrophils in the blood. Neutropenia is a common and potentially serious complication of myeloma, and is also a side-effect of some of its treatment.

Neutrophils are a type of white blood cell. White blood cells are made in the bone marrow and

form part of the immune system; their main function is to protect the body from infection.

There are five different types of white blood cell in the body which all have slightly different functions in the immune system. Neutrophils are the most common type and make up roughly 60% of all white blood cells. Their main function is to protect the body from infection caused by bacteria and fungi.

A normal neutrophil range in adults is  $2 - 7.5 \times 10^9 /L$ . Neutropenia is defined as a neutrophil count of  $0.5 - 1.0 \times 10^9 /L$  and severe neutropenia is defined as a neutrophil count of less than  $0.5 \times 10^9 /L$ .

When neutrophils decrease to less than  $1 \times 10^9/L$  patients become 'immunocompromised'. This means their immune system is impaired and unable to fight infection as normal. Immunocompromised patients are at risk of serious infections which can be fatal.

### **What causes neutropenia in myeloma?**

Blood cells are made in the bone marrow. In myeloma, abnormal plasma cells divide and spread within the bone marrow, eventually crowding out all of the normal blood cells and preventing the bone marrow from working properly. This means the bone marrow produces fewer blood cells, including neutrophils.

Neutropenia can also occur as a side-effect of some anti-myeloma treatments including thalidomide, Velcade® (bortezomib), Revlimid® (lenalidomide), cyclophosphamide and melphalan.

### **What are the symptoms of neutropenia?**

Neutropenia itself does not cause any symptoms. The first indication of neutropenia is often the signs and symptoms of an infection which, depending on the cause of the infection, may include:

- Fever (above  $38^{\circ}C$ )
- Chills and sweating
- Change in cough or a new cough
- Sore mouth and throat
- Blocked nose and/or ears
- Burning sensation or pain when passing urine
- Diarrhoea
- Nausea/vomiting
- Redness, swelling or soreness in any area
- Pain in the abdomen
- New onset of pain
- Rash
- Redness, heat or swelling around a HICKMAN®/PICC line or catheter

Infections can develop very quickly and in some cases they will need to be treated with antibiotics immediately.

It is very important to recognise the symptoms of infection and

report them immediately to your doctor or nurse, even if this is out-of-hours of your usual clinic times.

### **How is neutropenia diagnosed and monitored?**

Neutropenia is diagnosed through a routine blood test called a 'full blood count'. A full blood count measures your levels of neutrophils (and other blood cells). The measurements are then compared against a normal range of values.

Both your white blood cell levels and your neutrophil levels (known as the Absolute Neutrophil Count or ANC) will be monitored regularly through routine blood tests - your doctor or nurse will be checking your blood results regularly for signs of a low white blood cell count and neutropenia.

If you have a low neutrophil count, your doctor or nurse may perform further tests to confirm neutropenia or to monitor you for early signs of infection, including:

- A full assessment of your temperature, pulse, blood pressure and breathing rate (known as your vital signs)
- More detailed blood tests
- An analysis of your urine

- A swab sample of any suspected sites of infection

### **How is neutropenia treated?**

Neutropenia as a complication of the myeloma itself normally begins to improve with anti-myeloma treatment. As treatment begins to bring your myeloma under control, your bone marrow is often able to recover and will start producing normal amounts of neutrophils and other blood cells.

Where neutropenia is caused by the side-effects of treatment it may be necessary to temporarily postpone treatment or reduce your treatment dose until your neutrophil levels begin to return to normal.

If your neutrophil levels do not begin to improve after anti-myeloma treatment your doctor might prescribe granulocyte-colony stimulating factor (G-CSF) treatment, which stimulates your bone marrow to make more white blood cells including neutrophils.

Patients undergoing a stem cell transplant will be given prophylactic (preventative) antibiotic treatment. This is because their immune system

will be compromised as a consequence of receiving the high-dose chemotherapy that forms part of the transplant process.

### **Tips for avoiding and managing infection**

You should be vigilant for the symptoms of infection and report them immediately to your doctor or nurse.

Self-management tips to reduce the risk of infection include:

- Regularly washing your hands
- Keeping your skin moisturised to reduce the risk of skin cracks and wounds
- Avoiding crowds and people with obvious signs of infection
- Maintaining good oral hygiene, using antimicrobial mouth rinses if necessary
- Eating only fruit or vegetables that can be washed, peeled or cooked
- Eating only meat that is fully cooked
- Practising good kitchen hygiene i.e. chilling foods, separating raw and cooked meats, only eating food that is in date and using

separate chopping boards for preparation of different foods

- Avoiding unpasteurised milk or other unpasteurised food and drink
- Avoiding raw or undercooked eggs
- Avoiding activities that increase the risk of exposure to infection such as damp environments and handling pet litter

A raised temperature is one of the first signs of infection. Therefore it's a good idea to get a thermometer so that you can take your temperature if you suspect that you have an infection (your clinic should provide you with one of these).

### **Future directions**

Treatment of the underlying myeloma, taking preventative measures and G-CSF remain the most effective treatments for neutropenia. Research into new treatments for myeloma aims to develop drugs that target myeloma more effectively as well as minimise side-effects such as neutropenia.

## About this Infosheet

The information in this Infosheet is not meant to replace the advice of your medical team. They are the people to ask if you have questions about your individual situation. All Myeloma UK publications are extensively reviewed by patients and healthcare professionals prior to publication.

## Other information available from Myeloma UK

Myeloma UK has a range of Essential Guides, Infoguides and Infosheets available covering many areas of myeloma, its treatment and management.

To order your free copies or to talk to one of our Myeloma Information Specialists about any aspect of myeloma, call the **Myeloma Infoline: 0800 980 3332** or **1800 937 773** from Ireland

The Myeloma Infoline is open from Monday to Friday, 9am to 5pm and is free to phone from anywhere in the UK and Ireland. From outside the UK and Ireland, call **0131 557 9988** (charged at normal rate).

Information and support about myeloma is also available around the clock at [www.myeloma.org.uk](http://www.myeloma.org.uk)

# Notes

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**Myeloma Awareness Week 21 - 28 June**