

Myelosuppression

Myeloma Nurse Guide

The Myeloma Nurse Guide Series has been developed to enhance nurse knowledge, inform practice and support nurses in the delivery of high quality treatment and care to myeloma patients and families. The information has been reviewed by myeloma nurse and medical experts and should be used in conjunction with local and national policies, protocols and guidelines.

What is Myelosuppression?

Myelosuppression is a condition in which bone marrow activity is suppressed and production of blood cells reduced, leading to lowered levels of red blood cells (anaemia), white blood cells (leukopenia) and platelets (thrombocytopenia). Neutrophils are white blood cells commonly affected, and low numbers (neutropenia) increase a patients' risk of bacterial, viral, and fungal infection.

In myeloma, myelosuppression can occur if heavy bone marrow involvement reduces normal blood cell production. At diagnosis, 75% of patients present with anaemia, 20% with leukopenia, and 5% with thrombocytopenia. Myelosuppression is also a common side effect of many myeloma treatments. Infection is a major contributing factor in the morbidity and mortality in myeloma.

Clinical features

Symptoms of myelosuppression are related to the type of blood cells which are affected:

Anaemia

- Fatigue
- Shortness of breath
- Pallor
- Light-headedness
- Hypotension
- Tachycardia
- Loss of libido
- Reduced cognitive function

Neutropenia

- Raised temperature/fever
- Chills/sweats
- New or worsening cough
- Pain or difficulty passing urine
- Diarrhoea/nausea/vomiting
- Sore mouth, nasal congestion
- Areas of redness, swelling or soreness

Thrombocytopenia

- Bruising
- Petechiae/purpura
- Bleeding gums
- Blood in stool, urine or vomit
- Bleeding from intravenous lines or urinary catheters

Neutropenic sepsis is a medical emergency which requires immediate treatment with broad spectrum antibiotics.

Assessment and monitoring

Assessment features	Rationale
Anaemia	
Review regularly for symptoms of anaemia	To enable prompt management
Check for causes of bleeding, e.g. from the GI tract	To check for anaemia caused by blood loss
Blood tests: iron, folate and vitamin B12	To detect and correct any vitamin or mineral deficiencies
Neutropenia	
Observe vital signs	To pick up signs of infection promptly
Blood tests: FBC, infection markers (CRP)	To establish cause and severity of infection, and instigate appropriate treatment
If signs of infection do a septic screen (stool/sputum/urine specimens, swabs for microbiology and virology, blood cultures)	
Thrombocytopenia	
Blood tests: platelets, clotting screen	To reduce risk of bleeding
Observe for bruising or bleeding	To pick up and manage any bleeding promptly

The severity of anaemia, neutropenia or thrombocytopenia can be graded, as shown in the Appendix.

Prevention and treatment

If myelosuppression is disease related, symptoms may improve with successful myeloma treatment.

Treatment-induced anaemia may benefit from an initial trial of an erythropoiesis-stimulating agent (ESA). Other strategies include reducing the dose of myeloma treatment and/or blood transfusion.

Patients undergoing myeloma treatment may need prophylactic antibiotics, anti-viral and anti-fungal drugs according to the treatment regimen. If neutropenia develops, dose reduction or a treatment break may be needed. In some cases granulocyte colony stimulating factor (G-CSF) injections are used to boost neutrophil counts. Patients who have frequently recurring infections may, if eligible, have intravenous immunoglobulins (IVIG) prescribed. In the longer term, vaccination against influenza, Haemophilus influenza and Streptococcus pneumonia is recommended in myeloma, as well as COVID-19 vaccination in line with government guidance.

Thrombocytopenia can occur with many myeloma treatments, including proteasome inhibitors. Management strategies include dose-reduction or pausing anti-myeloma treatment, platelet transfusion to support counts, and reviewing any anti-coagulation treatment.

Nursing management points

Assessment and monitoring

- Be aware of blood counts and any changes and trends in levels
- Explain to patients the importance of regular monitoring when on treatment

Prevention and treatment

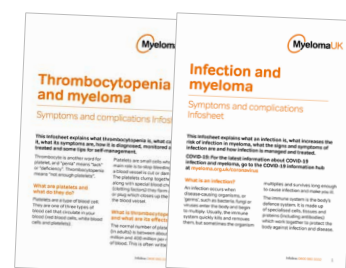
- Educate patients on the risks and benefits of blood transfusion
- Avoid the use of non-steroidal anti-inflammatory drugs (NSAIDs)
- Advise patients about safety and precautions to reduce the risk of falls

Self-care strategies for patients

- Help patients understand measures to reduce infection risk by:
 - Regular and effective hand hygiene
 - Avoiding crowds and people with obvious signs of infection
 - Wearing a face mask when necessary or preferred
 - Having a working thermometer, knowing how to take temperature and when and how to report a raised temperature
 - Maintaining good oral hygiene
 - Eating fruits and vegetables that can be washed, peeled or cooked
 - Cooking meat fully and avoiding unpasteurised milk and raw/undercooked eggs, and having good food hygiene
 - Not handling pet litter and wearing protective gloves for gardening
- Help patients understand measures to reduce the risk of bleeding by:
 - Avoiding contact sports, body piercing and tattooing
 - Using a soft toothbrush and taking care when using floss or brushes
- Help patients understand measures to combat effects of anaemia by:
 - Taking regular, gentle exercise where possible, to combat fatigue
 - Provide information about fatigue management

Patient information key points

- Provide written information to help patients understand myelosuppression and its effects
- Explain how to recognise and report symptoms, and the importance of reporting a high temperature
- Educate patients on preventative measures to reduce infection risk



References



A list of key references is available on Myeloma Academy:
academy.myeloma.org.uk/myeloma-nurse-guide-references

Appendix

Common Terminology Criteria for Adverse Events Grading Criteria for haematological effects

Adverse event	Unit of measurement	1	2	3	4
Anaemia	Haemoglobin (g/dL)	<LLN-10	8-10	<8 transfusion indicated	Life-threatening consequences: urgent intervention indicated
Neutropenia	Absolute neutrophil count (10^9 /L)	<LLN-1.5	1-1.5	0.5-1	—
Thrombocytopenia	Platelet count (10^9 /L)	<LLN-75	50-75	25-50	<25

LLN – Lower limit of normal



Myeloma★Academy

For further nurse guides and other educational resources on myeloma and related conditions:

academy.myeloma.org.uk

Published by:	Myeloma UK
Publication date:	August 2022
Last updated:	August 2022
Review date:	December 2024

Myeloma UK 22 Logie Mill, Beaverbank Business Park, Edinburgh EH7 4HG

☎ 0131 557 3332 ✉ myelomauk@myeloma.org.uk

Registered Charity No: SC026116