

Myeloma kidney disease

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 myeloma kidney disease?

Myeloma kidney disease is a common, potentially serious complication of myeloma and a major cause of morbidity and mortality. Myeloma kidney disease can be present at diagnosis or at relapse. Up to 20% of patients have acute renal failure at diagnosis, and of these, 10% will require dialysis. Renal impairment can also evolve over time, with an estimated further 40% of patients affected during their myeloma course.

Myeloma kidney disease results from co-precipitation of excessive myeloma free light chains and Tamm-Horsfall proteins in the distal renal tubules. This interaction forms casts which block the tubules and cause interstitial inflammation and fibrosis (cast nephropathy). In myeloma, free light chains are also toxic to the proximal renal tubules.

Other factors that can increase the risk of renal impairment include:

- Dehydration
- Hypercalcaemia
- Infections and sepsis
- Exposure to nephrotoxic drugs (e.g. non-steroidal anti-inflammatory drugs (NSAIDs), aminoglycoside antibiotics, bisphosphonates) or contrast dyes used in some scans
- Co-morbidities e.g. diabetes, hypertension, prostatic obstruction and heart failure
- Plasma cell infiltration, amyloid or light chain deposition disease

Clinical features

Clinical consequences of myeloma kidney disease are metabolic acidosis, uraemia, anaemia, fluid and electrolyte imbalance and renal failure. Symptoms can be vague and are often not apparent until renal impairment is advanced. Symptoms can include:

- Reduced urine output (oliguria)
- Frothy urine
- Fatigue
- Swollen feet/ankles
- Shortness of breath
- Headache
- Thirst
- Nausea

Laboratory findings that may suggest renal impairment are asymptomatic proteinuria and raised serum creatinine.

Assessment and monitoring

Pre-treatment and regular monitoring are important for all myeloma patients to detect renal impairment early, and assess any deterioration of function. The estimated glomerular filtration rate (eGFR) estimates how many millilitres of waste fluid the kidneys filter from the blood per minute. A person's serum creatinine, age, gender and race are needed to make this calculation. Chronic kidney disease (CKD) is classified using the GFR and the ACR (albumin/creatinine ratio), as shown in the Appendix.

Assessment and monitoring may include the following investigations and review:

Assessment features	Rationale
Regular bloods tests: full blood count; albumin; urea, creatinine, urate, electrolytes (including calcium, phosphate and potassium)	To pick up signs of worsening renal function as early as possible To monitor renal function and response to clinical management
EDTA – measures blood clearance of radiolabelled EDTA	To obtain an accurate GFR, e.g. before high dose therapy and stem cell transplant
Urine tests	24-hour urine for creatinine clearance Urine test for protein:creatinine ratio, to check for proteinuria
Renal biopsy	In some patients, e.g. if suspected monoclonal gammopathy of renal significance (MGRS) or amyloidosis
Review patients for symptoms	To pick up early signs of deterioration and prevent renal complications To manage clinical symptoms

Prevention and treatment

Treatment and prevention of kidney damage is important and varies according to the individual and their treatment protocol. Important elements of care are good hydration, reduction of exposure to nephrotoxic drugs and control of any contributory factors.

Patients with newly diagnosed myeloma, who have myeloma-induced acute kidney disease, usually receive immediate treatment with a dexamethasone and bortezomib based combination regimen. Patients may initially need daily fluid rehydration with normal saline, and a modified dose of bisphosphonates to treat hypercalcaemia. Close input from the renal team is advised.

Erythropoiesis stimulating agents (ESAs) or blood transfusions may be used to prevent or treat chronic anaemia.

Nursing management points

Assessment and monitoring

- Observe for symptoms of renal impairment
- Explain any investigations and what is involved, e.g. doing a 24hr urine collection, having an EDTA test
- Be vigilant for signs of infection

Prevention and treatment

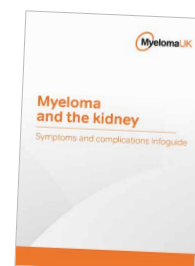
- Understand which drugs and doses are used in myeloma. Patients may need dose modification in renal impairment*
- Encourage myeloma patients to drink well (2–3 litres daily) to maintain kidney health. If the renal team are involved, follow their guidance on the recommended fluid intake for the patient
- Understand and recognise the importance of good control of comorbidities such as diabetes and hypertension
- Monitor use of erythropoiesis stimulating agents (ESAs) or blood transfusions
- For patients on dialysis, ensure good liaison is in place between haematology and renal teams. Follow any myeloma treatment administration requirements, e.g. Velcade® (bortezomib) is administered after dialysis
- Refer to dietician for advice on any dietary restrictions required

Self-care strategies for patients

- Report any new or worsening symptoms to your doctor or nurse
- Avoid taking NSAID-type painkillers
- Adhere to any fluid or diet restrictions advised, such as a low-potassium or low-salt diet

Patient information key points

- Provide written information to help patients understand about the risk of kidney disease
- Ensure patients understand the need to drink well and avoid NSAIDs/other nephrotoxic drugs
- Explain how to recognise and report symptoms of renal impairment



References



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

* Dose modification and/or special instructions for administration on all drugs are available on the Electronic Medicines Compendium website <https://www.medicines.org.uk/emc>

Appendix

Classification of chronic kidney disease

GFR and ACR categories and risk of adverse outcomes			ACR categories (mg/mmol) description and range		
			<3 Normal to mildly increased A1	3–30 Moderately increased A2	>30 Severely increased A3
GFR categories (ml/min/1.73m ²) description and range	>90 Normal and high	G1	No CKD in the absence of markers of kidney damage		
	60–89 Mild reduction related to normal range for a young adult	G2			
	45–59 Mild-moderate reduction	G3a*			
	30–44 Moderate-severe reduction	G3b			
	15–29 Severe reduction	G4			
	<15 Kidney failure	G5			

Increasing Risk ↓

← Increasing Risk →

* Consider using eGFRcystatinC for people with CKD G3aA1



Myeloma★Academy

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

academy.myeloma.org.uk

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