

Acute kidney injury in patients with sickle cell disease: Clinical guideline

Introduction

Acute kidney injury (AKI) in the sickle cell disorders (SCD) may be consequent upon vaso-occlusion causing ischaemia in the renal medulla, and may have contributions from dehydration, drugs (e.g. non-steroidal anti-inflammatories, antibiotics or contrast dye) or infection. It is important to consider non-sickle cell related causes of AKI in the differential diagnosis.

As patients with SCD have hyperfiltration and low baseline creatinine levels, it is important to look at trends in creatinine rather than absolute value. Acute kidney injury should be considered in patients with SCD who present with oliguria, a fall in GFR or rapidly rising creatinine and should be referred for emergency management to the Oxford Kidney Unit or local renal team, who will guide specific management.

AKI staging criteria in adults (NICE, 2018)

Stage	Criteria
1	<p>Creatinine rise of 26 micromol or more within 48 hours OR</p> <p>Creatinine rise of 50–99% from baseline within 7 days* (1.50–1.99 x baseline) OR</p> <p>Urine output** < 0.5 mL/kg/h for more than 6 hours</p>
2	<p>100–199% creatinine rise from baseline within 7 days* (2.00–2.99 x baseline) OR</p> <p>Urine output** < 0.5 mL/kg/hour for more than 12 hours</p>
3	<p>200% or more creatinine rise from baseline within 7 days* (3.00 or more x baseline) OR</p> <p>Creatinine rise to 354 micromol/L or more with acute rise of 26 micromol/L or more within 48 hours or 50% or more rise within 7 days OR</p> <p>Urine output** < 0.3 mL/kg/hour for 24 hours or anuria for 12 hours</p>
<p>* the rise is known (based on previous blood tests) or presumed (based on history) to have occurred within 7 days. † Risk, Injury, Failure, Loss, End stage ‡ Acute Kidney Injury Network § International Kidney Disease: Improving Global Outcomes</p> <p>** Measurement of urine output may not be practical in a primary care population, but can be considered in a person with a catheter.</p>	

<https://cks.nice.org.uk/acute-kidney-injury#!scenario>

Measures to mitigate renal damage should be instigated immediately, including clinical assessment to include daily weight, fluid balance and palpable bladder, stopping NSAIDs, withholding ACEI / ARB, reviewing drug lists for potential nephrotoxins and hydrating patients well.

Initial investigations

Venous blood gas (Arterial blood gas – if unwell but venous will answer most renal questions)

FBC

Urea and Electrolytes

PT and APTT

CK

CRP

Urine protein/creatinine ratio

ANA and immunoglobulins

Urine culture and microscopy for casts

ESR

ECG to assess for changes of hyperkalaemia (if appropriate)

LFTs

Renal Ultrasound

Role of exchange blood transfusion

There is no evidence that exchange blood transfusions should be used to treat AKI in patients with SCD. Transfusions should only be used if there are other concurrent indications. When AKI occurs in the context of multi-organ failure from a vaso-occlusive crisis, an exchange blood transfusion should be discussed with the consultant on call.

Referral

Referral to the local Renal Team when AKI is suspected, and urgently for AKI stage 3 or AKI on a background of stage 4/5 CKD

OUH: Contact the duty Renal SpR on call via the Churchill Hospital Switchboard (01865 741841 / Bleep 5924)

References

Standards for the Clinical Care of Adults with Sickle Cell Disease in the UK © Sickle Cell Society 2018

Evidence based management of sickle cell disease, Expert Panel Report 2014 ([link here](#))

NICE (2018) Acute Kidney Injury. <https://cks.nice.org.uk/acute-kidney-injury#!scenario>

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Review

Name	Revision	Date	Versio n	Review date
Wale Atoyebi	Pre-peer review	Jan 2013	1.1	Jan 2015
Deborah Hay	Routine review	Aug 2015	1.2	Jan 2017
Noémi Roy, Dr Katherine Bull, OUH Renal Team	Routine review	Nov 2019	2.0	Nov 2021
Wale Atoyebi	Logo updated, routine review	August 2021	2.1	August 2023
Noémi Roy, Katherine Bull	Full review	November 2023	3.0	November 2025