Acute Kidney Injury: Recognition and Response

RCGP LEARNING

Background and Diagnosis

Definition	Background	Consequences
• Sudden drop in kidney function occurring over hours or days • Determined using internationally recognised criteria based on changes in serum creatinine compared to the person's baseline and /or reduction in urine volume	• Approximately two thirds of cases begin in the community • UK laboratories present AKI warning stage alerts when potentially significant results are identified in line with the national AKI algorithm • False positives and negatives can occur	• Associated with high mortality: illness associated with AKI in hospital has 20% mortality • Incomplete recovery and risk of developing or worsening CKD • Increased risk of CVD • Raised readmissions in next 90 days

Recognising risk

Identifying risk	Risk group: chronic disease	Risk group: fluid status
• Look for AKI in people with acute illness and particular risk factors • Not all patients with AKI have an acute illness, e.g. sudden worsening of CKD, new onset or significant worsening of urological symptoms, signs of multisystem disease	• Chronic kidney disease • Diabetes • Haematological malignancy • Heart failure • Liver disease • Urological obstruction	• Hypotension • Hypovolaemia • Oliguria (output <0.5ml/kg/hr) • Reduced access to fluids due to dependence on carer • Severe diarrhoea, especially bloody diarrhoea in young people
Acute illness	**Medication**	**Other characteristics**
• Sepsis • Suspected nephritis (oedema, haematuria)	• NSAIDs • ACEIs/ARBs • Diuretics • Iodine-based contrast media	• Age 65 or over • History of AKI

Key questions in response to AKI finding

Why was the blood test done?	Is this true AKI?	False positive
• Routine test or chronic disease/drug monitoring: AKI less likely than if acute illness • AKI 1: Current creatinine ≥1.5 x baseline level (or creatinine rise >26 µmol/L 48 hrs) • AKI 2: Current creatinine ≥2 x baseline level • AKI 3: Current creatinine ≥3 x baseline level (or creatinine 1.5 x baseline and >354 µmol/L)	• Acute illness: AKI more likely – high pre-test probability; clinical stability suggests low pre-test probability • Does the patient have known CKD and is creatinine change due to progression rather than AKI (especially likely if previous creatinine >12 months old)? • Any other indicators of a false positive result?	• Recent pregnancy: creatinine rise normal post-delivery • Drugs inhibiting tubular creatinine secretion (e.g. trimethoprim): cause creatinine rise whilst GFR stable • Recent IV fluid: spuriously low baseline creatinine • False negative can happen if there has been an AKI in the past year: algorithm creates falsely high baseline for the patient

Assessment of AKI

Low pre-test probability of AKI	High pre-test probability of AKI	Indicators for earlier review
• AKI 1: Clinical review ≤72h of alert • AKI 2: Clinical review ≤24h of alert • AKI 3: Clinical review ≤6h of alert, consider admission	• AKI 1: Clinical review ≤24h of alert • AKI 2: Clinical review ≤6h of alert • AKI 3: Consider immediate admission	• Poor oral intake/urine output • Hyperkalaemia >6.0 • Known CKD 4/5 or renal transplant • Immunodeficiency • Frail with comorbidities • Previous AKI • Suspected intrinsic kidney disease • Suspected urinary tract obstruction