

Acute Kidney Injury In Primary Care

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Aims and Objectives

- Definition of Acute Kidney Injury (AKI)
- Review NICE Clinical Practice Guidelines on AKI
- Promote early detection and management of AKI

What is AKI?

Acute Kidney Injury (AKI)

- replaces the term Acute Renal Failure
- rapid reduction in kidney function
 - occurs over hours to days
 - recognises a spectrum of injury
 - early injury to organ failure
 - promotes
 - earlier detection
 - prompt management

AKI Definition – KDIGO

AKI	Serum Creatinine criteria	Urine output criteria
Criteria	Creatinine (Cr) increase ≥ 26 $\mu\text{mol/L}$ within 48 hrs <u>or</u> Creatinine (Cr) increase 1.5–1.9 fold from baseline	< 0.5 mL/kg/hr for 6 consecutive hrs

AKI Staging – KDIGO

AKI stage	Serum Creatinine criteria	Urine output criteria
1	SCr increase $\geq 26 \mu\text{mol/L}$ within 48 hrs <u>or</u> SCr increase 1.5–1.9 fold from baseline	$< 0.5 \text{ mL/kg/hr}$ for 6 consecutive hrs
2	SCr increase 2–2.9 fold from baseline	$< 0.5 \text{ mL/kg/hr}$ for 12 hrs
3	SCr increase ≥ 3 fold from baseline <u>or</u> SCr increase $\geq 354 \mu\text{mol/L}$ <u>or</u> initiated on RRT (irrespective of stage at time of initiation)	$< 0.3 \text{ mL/kg/hr}$ for 24 hr <u>or</u> anuria for 12 hr

So What?

If the patient gets better the AKI
recovers.....

Consequences of AKI

- Even relatively small rises in creatinine are associated with increased
 - morbidity
 - mortality
- Long – term risk of chronic kidney disease

Acute Kidney Injury

- Most commonly associated with acute illness
 - recovery usual if patient recovers from primary cause of illness
 - severe AKI may progress to chronic kidney disease
- Rarer forms
 - require rapid recognition for specific therapy
 - e.g. Lupus vasculitis

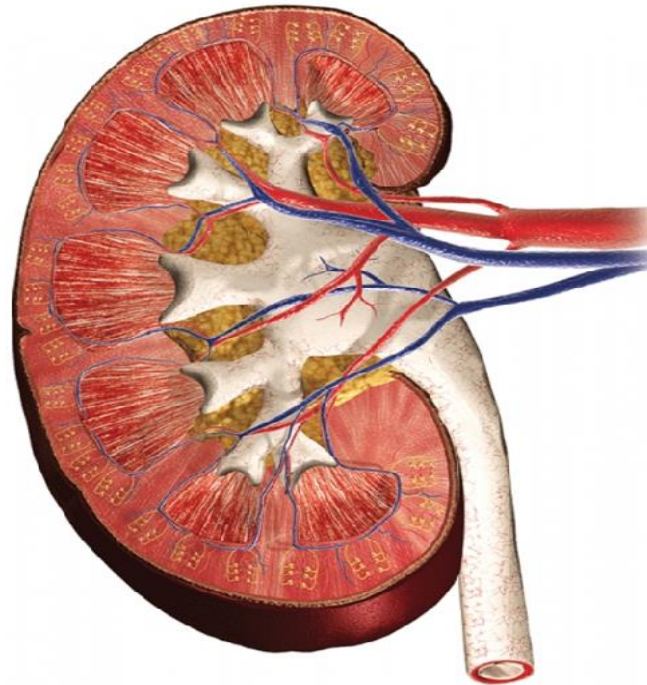
Cause of AKI

- essential to establish cause
- cause determines treatment and future prevention
- majority but not all AKI is secondary to
 - sepsis, hypotension and nephrotoxins
- important to identify rarer causes

AKI is a Syndrome

Intrinsic AKI

- Acute tubular injury
 - Prolonged pre-renal AKI
 - Rhabdomyolysis
 - Haemoglobinuria
 - Nephrotoxins
 - Iodinated contrast
 - NSAIDs
 - Gentamicin
- Tubulointerstitial injury
- Glomerulonephritis
- Myeloma
- Vasculitis
 - Lupus
 - ANCA associated



Pre-renal AKI

- Sepsis
- Hypovolemia
 - Haemorrhage
 - Burns
 - Vomiting/Diarrhoea
 - Diuretics
- Hepato-renal Syndrome
- Cardiac Failure
- Hypotension
 - Medications

Post-renal AKI

- Kidney stones
- Prostatic hypertrophy
- Tumours
- Retroperitoneal fibrosis

What is the relevance of AKI to the GP?

- It is estimated that 1 in 5 emergency admissions into hospital are associated with AKI
- 50% of acute medical patients are taking nephrotoxic medication prior to admission
- Frail patients in the community on multiple medications are at risk of AKI

NICE AKI Guideline

Acute kidney injury: prevention, detection and management up to the point of renal replacement therapy (CG169)

- **Guidance from the National Institute for Health and Care Excellence**
 - **August 2013**
 - **www.nice.org**

Dr Rajib Pal (expert adviser)
GP Principal, Hall Green Health, West Midlands

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Kidney checks on hospital patients 'would save lives'

By Michelle Roberts

Health editor, BBC News online

Hospital patients should have their kidneys checked to spot a potentially lethal condition affecting one in six of those admitted, say new guidelines.

The National Institute for Health and Care Excellence says the NHS in England could save at least 12,000 lives and millions of pounds a year if it follows its advice.

Acute kidney injury (AKI) is almost entirely preventable but kills up to one in every four sufferers.



Most people who develop AKI are over the age of 65

Related Stories

NHS England - Workstreams

AKI – sits under *Patient safety*

- Detection
- Risk Assessment
- Management
- Education

The NCGC is a governance partnership between:



AKI - Electronic Alert

- NHS England issued a Stage 3 Directive
- AKI e-alert based on creatinine values
- Launched in Hospitals 2015
- Planned for launch in Primary care 2016
 - Alert will identify any patient with AKI based on creatinine values
 - Alert will identify the stage of AKI



Patient Safety Alert

Stage Three: Directive
*Standardising the early
identification of
Acute Kidney Injury*

9 June 2014

Alert reference number: NHS/PSA/D/2014/010

Alert stage: Three - Directive

Actions

With NHS

Key Learning Points:

Remember the 5Rs of AKI

5Rs of AKI

- 5R's
 - Risk
 - Recognition
 - Response
 - Renal Referral
 - Rehabilitation

Risk Factors for AKI

– Non-modifiable

- chronic kidney disease (eGFR < 45 mls/min/1.73 m
- cardiac failure
- peripheral vascular disease
- diabetes mellitus (with proteinuria)
- liver disease
- myeloma

– Modifiable

- sepsis
- hypotension
 - hypovolaemia
 - medications e.g. antihypertensives, diuretics
- nephrotoxins e.g. NSAIDs

Risk of AKI

- Opportunity
 - Primary care covers almost 100% of population
- with computerisation and a capitation based system, UK general practice is in a unique position to identify people at risk of AKI and address potentially modifiable exposures

Recognition

- Consider checking kidney function and urinalysis in a patient who is ***at risk*** of AKI and presents with
 - Acute illness
 - Inability to maintain oral intake
 - Low blood pressure

Recognition

- Perform a urinalysis in a patient who is non-specifically ill with
 - fever
 - rash
 - joint pains
- If urinalysis is positive for blood and protein
 - exclude UTI
 - check kidney function

Response – **STOP** AKI

- **S**epsis – recognise and treat promptly
- **T**oxins - consider stopping/avoiding
 - nephrotoxic medications e.g. NSAIDs
- **O**ptimise blood pressure
 - optimise volume status – e.g. oral fluids
 - review antihypertensive medication e.g. diuretics, ACEi
- **P**revent harm
 - Review medications and doses
 - Identify the cause

Renal Referral

Discuss the management of acute kidney injury with a nephrologist or paediatric nephrologist as soon as possible and within 24 hours of detection when one or more of the following is present:

- a possible diagnosis that may need specialist treatment (for example, vasculitis, glomerulonephritis, tubulointerstitial nephritis or myeloma)
- acute kidney injury with no clear cause
- inadequate response to treatment
- complications associated with acute kidney injury
- stage 3 acute kidney injury (according to (p)RIFLE, AKIN or KDIGO criteria)
- a renal transplant
- chronic kidney disease stage 4 or 5 (see [stages of chronic kidney disease](#) for more details).

Rehabilitation

- Identify the cause of AKI and risk factors
- Review medications
- Monitor blood pressure and kidney function longer term
- Empower patients by educating them on the cause of AKI and any potential steps they could take in the future to avoid AKI

Case 1

- 80 year old female
- Past medical history of
 - Ischaemic heart disease
 - Dementia
 - Diabetes Mellitus
- 1 week history of increased confusion and abdominal discomfort
- Family thinks she has a urinary tract infection
- On metformin and candesartan
- BP 122/70
- Unable to produce a urine sample when asked

Case 1

- Initial diagnosis UTI
- Prescribed Trimethoprim
- 2 days later (Friday) patient presented with increasing confusion and generally more unwell
- BP 102/50 dizzy
- Urine sample was successfully collected
- Urinalysis - protein only
- Bloods sent
- Diagnosis “partially treated UTI”
- Trimethoprim continued

Case 1

- After the weekend bloods results are reviewed
 - Creatinine 144 $\mu\text{mol/L}$
 - Potassium 5.6 mmol/L
 - Urea 13.1 mmol/L
- No baseline creatinine for comparison
- 2 days later the patient was reviewed again
- Finished courses of antibiotics but is still unwell
- Oral intake is noted to be low and “feels unwell”
- Urine culture result is NO growth
- Repeat bloods done
- Lab phones with results
 - Creatinine 221 $\mu\text{mol/L}$
 - Potassium 5.5 mmol/L
 - Urea 20.2 mmol/L

Case 1

- Does the patient have AKI?
- Yes - the creatinine is rising
- What would you do?
- Case was discussed in the practice and with the renal registrar on call
- Metformin and candesartan were held
- Encouraged to push fluids (husband was told to make sure she drank at least 1.5 litres)

Case 1

- Bloods rechecked 24 hours later
 - Creatinine 90 $\mu\text{mol/L}$
 - Potassium 5 mmol/L
 - Urea 13.8 mmol/L
- Medication was held for a further 2 days and then metformin was restarted
- BP was still only 109/62 and so candesartan was not restarted.
- Creatinine recovered to 65 $\mu\text{mol/L}$

Case 1

- Points to consider
- Initial cause of confusion is unclear but had resulted in poor fluid intake
- The patient had multiple risk factors for AKI
- Did the patient need to be on an Angiotensin receptor blocker?
 - History of raised BP 3 years ago with minimal proteinuria

Case 2

- 65-year-old female
- Presented to GP
 - Lethargy
 - Increased joint pains
 - Increased swelling of ankles
- Past medical history
 - Hypertension
 - Diverticular disease
 - Tinnitus

Case 2

- Urinalysis
 - Blood and protein
- Creatinine 65 $\mu\text{mol/L}$ (eGFR > 90)
- Referred to urology
 - Normal ultrasound of the kidneys and cystoscopy
- Repeat creatinine 102 $\mu\text{mol/L}$ (eGFR 44)
- Does the patient have acute kidney injury?
- What would you do?

Case 2

- Patient referred
 - Immunology screen
 - ANCA positive
 - Kidney biopsy
 - ANCA associated vasculitis
 - Treatment
 - Steroids
 - Cyclophosphamide

Opportunity

- For better patient care
- Empower the patient
- Individual care plans
- Good interface strategies in all CCGs and Trusts
- Utilising existing guidelines and resources
- Working with other healthcare professionals in Care homes and Local pharmacies

Typical Discharge

Summary

- **PRIMARY DIAGNOSIS / PROCEDURE and ADVICE to GP**
AKI secondary to urosepsis
- **GP INFORMATION:**
Patient admitted as an emergency with abdominal pain
- Diagnosed with urosepsis secondary to a blocked catheter
- Diagnosis of acute kidney injury Creatinine rise from 95 $\mu\text{mol/L}$ to 200 $\mu\text{mol/L}$
- Treated with IV aztreonam and improved
- PEG feed was re-started at half normal volumes on 26/6/14
- Discharged on oral antibiotics
- Concerns raised by family regarding urinary catheter flushes which when stopped appear to contribute to recurrent infections. Please could this be reviewed and restarted in the community.

How might you write a care plan to reduce risk of further AKI?

Care Planning

- Recommend the following
 - Identified risk factors for AKI
 - Review medication
- Monitor hydration status with respect to PEG feed and fluid
- Urinary catheter care plan
 - antibiotics on catheter changing
 - organise a urinary catheter update from the continence community team
 - early recognition of decreased urine output and appropriate response

Discussion Points

- Patients at risk – how to identify
 - role of electronic alerts
- Development of care plans for patients at increased risk
- Utilisation of current guidelines and resources
 - Yorkshire and Humber Acute Kidney Injury Patient Pathway www.aki.org.uk
 - NICE www.nice.org
 - NHS England www.thinkkidneys.nhs.uk/

Thank you

Any Questions?