Covid-19 and Acute Kidney Injury in Hospital: Summary of Nice Guidelines

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Introduction

Acute kidney injury (AKI), a sudden reduction in kidney function, is seen in some people with covid-19 infection. A subset of patients develops severe AKI and need renal replacement therapy (RRT). As in many settings, the event of AKI is related to an increased risk of mortality.

Although our understanding is incomplete, an image is emerging from case reports and autopsy series of covid-19 specific causes of AKI. Intrinsic renal pathology including thrombotic vascular processes, viral mediated tubular cell injury, and glomerulonephritis are reported, also as AKI resulting from extrinsic factors like fluid depletion, multi-organ failure, and rhabdomyolysis.

Anecdotal reports have emerged of proximal tubular injury with Fanconi syndrome that manifests as hypokalaemia, hypophosphataemia, normal anion gap acidosis , and hypovolaemia from salt wasting. Importantly, AKI can occur in the least stages of covid-19 infection, so clinical vigilance and consideration of risk factors for AKI alongside early detection and diagnosis are essential components of general supportive care. Fluid management is central to the present.

Recommendations

Communicating with patients

Communicate effectively with patients, their families, and carriers, and support their mental wellbeing to assist alleviate any anxiety they'll have about covid-19. Signpost to charities and UK government guidance on the psychological state and wellbeing aspects of covid-19.

Minimising risk for patients and healthcare workers

All healthcare workers involved in receiving, assessing, and caring for patients who have known or suspected covid-19 should follow UK government guidance for infection prevention and control. If covid-19 is later diagnosed during a patient not isolated from admission or presentation, follow UK government guidance on management of exposed healthcare workers and patients in hospital settings.

Planning treatment and care

Discuss the risks, benefits, and certain outcomes of treatment options with patients with covid-19, and their families and carers. this may help them make informed decisions about their treatment goals and needs , including treatment escalation plans where appropriate

Find out if patients have advance care plans or advance decisions to refuse treatment, including "do not attempt cardiopulmonary resuscitation" decisions, and appreciate of those in planning care.

Assessing for AKI in patients with suspected or confirmed covid-19

Be aware that, in patients with covid-19, AKI

may be common, but prevalence is uncertain and depends on clinical setting; the medical care National Audit and Research Centre's report on covid-19 in critical care reported that 31% of patients on ventilators and 4% not on ventilators needed renal replacement therapy for AKI

1. Is related to an increased risk of dying

2. Can develop at any time before or during hospital admission

3. Causes may include volume depletion (hypovolaemia), haemodynamic changes, virus infection leading on to kidney tubular injury, thrombotic vascular processes, glomerular pathology, or rhabdomyolysis

4. May be related to haematuria, proteinuria, and abnormal serum electrolyte levels (both increased and decreased serum sodium and potassium).

5. Maintaining optimal fluid status (euvolaemia) is critical in reducing the incidence of AKI, but this will be hard to realize

6. Treatments getting used to manage covid-19 may increase the danger of AKI—for example, diuretics if they need caused volume depletion (hypovolaemia)

7. Fever and increased rate of respiration increase insensible fluid loss

Dehydration (often needing correction with intravenous fluids) is common on admission to hospital and should also develop later risk of coagulopathy is increased.

1. On hospital admission or transfer, assess for AKI altogether patients Record medical record and comorbidities, including factors that further increase the danger of AKI (such as CKD, coronary failure , disease , diabetes, history of AKI)

2. Fluid status by clinical examination (for example, peripheral perfusion, capillary refill, pulse, vital sign , orthostatic hypotension , jugular blood pressure , or pulmonary or peripheral oedema)

3. Fluid status by fluid balance (fluid intake, urine output, and weight).

4. Full Blood count

5. Serum urea, creatinine, and electrolytes (sodium, potassium, bicarbonate).

6. Review the utilization of medicines which will cause or worsen AKI and stop these unless essential.

7. Ask a pharmacist for advice about optimising the selection and dosage of medicines, including anticoagulants for treatment or prophylaxis. More detailed information is out there within the Think Kidneys guidelines for medicines optimisation in patients with

8. Continue to assess for AKI. Record and monitor fluid status by clinical examination and fluid balance daily.

Detect AKI using NHS England's AKI algorithm or any of the subsequent criteria: an increase in serum creatinine of ≥26 μmol/L in 48 hours an increase of ≥50% in serum creatinine, known or presumed to possess occurred within the past seven days a fall in urine output to ≤0.5 mL/kg/hour for quite six hours. Do urinalysis for blood, protein, and glucose to assist identify the explanation for AKI. Record the results and take action if these are abnormal (including referral if needed; see section below on referral in patients with suspected or confirmed covid-19). Perform imaging if tract obstruction is suspected

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Managing fluid status in patients with suspected or confirmed covid-19

1. Aim to realize and maintain optimal fluid status (euvolaemia) altogether patients.

2. If there's volume depletion (hypovolaemia) and fluid needs can't be met orally or enterally, give patients intravenous fluids as a part of a protocol to revive and maintain optimal fluid status (euvolaemia).

3. Ensure patients have an intravenous fluid management plan that's reviewed daily.

4. Base choice of fluids on biochemistry results and fluid status.

Managing hyperkalaemia in patients with suspected or confirmed covid-19

1.Be conscious of the danger of hyperkalaemia and manage consistent with local protocols.

2. The potassium binders patiromer and sodium zirconium cyclosilicate are often used alongside standard look after the emergency management of acute life threatening hyperkalaemia (these agents are approved by NICE for this indication

Referral in patients with suspected or confirmed covid-19

Refer patients with AKI for further specialist advice if

1. There is diagnostic uncertainty about the explanation for AKI, which can need further tests or imaging

2. They have abnormal urinalysis results, which can be a symbol of covid-19 induced kidney damage or other intrinsic renal disease

3. Fluid management needs are complex

4. AKI is worsening despite initial management or has not resolved after 48 hours

5. The patient has usual indications for renal replacement therapy, particularly if there's no urine output, such as

6. life threatening hyperkalaemia

7. refractory fluid overload

8. severe acidosis .

Renal replacement therapy in patients with suspected or confirmed covid-19

The scope of the rule didn't include an in depth review of the technical aspects of provision of renal replacement therapy (RRT) in covid-19. Resources were signposted as follows:

NHS England has produced a clinical guide renal replacement therapy options in critical care during the coronavirus pandemic for options for patients with usual indications for RRT supported local availability, equipment, supplies, staffing, and native expertise.

Areas of Debate:

1. Information regarding renal involvement in covid-19 is extremely limited in several areas, and further evidence is required. a number of the foremost pressing questions include

2. What is that the incidence of AKI in hospitalised patients with covid-19, both in and out of doors of the medical care unit?

3. What, if any, are the standard clinical, laboratory, and urinary features that characterise AKI within the setting of covid-19?

4. What are the various histological patterns of renal involvement in covid-19 and the way do these relate to clinical presentation?

5. What are the future effects of covid-19 on renal function, including the proportion of survivors who require ongoing renal replacement therapy resulting from end stage kidney disease?

6. Guidelines into practice

7. Can you identify patients with covid-19 who are at particular risk of sustaining AKI?

8. Do you recognize which patients with covid-19 associated AKI should be referred for specialist advice, and does one know your local referral pathway?

9. How should patients who have sustained covid-19 associated AKI be followed up in medical care , and does one know where to seek out RCGP guidance on AKI care after hospital discharge?