

Hyperkalaemia

Definition

Serum K^+ > 5.5mmol/l

- Medical emergency if **plasma K^+ \geq 6.5** mmol/l or symptomatic (eg peaked T waves, prolonged PR interval, loss of P waves, widened QRS complex, AV block - See attached ECG) at any level of hyperkalemia. Acute hyperkalemia carries a poorer prognosis than chronic hyperkalemia.
- Hyperkalemia is also a common manifestation of significant acidosis and responds to management of the acidosis.

Causes to consider initially

- Factitious hyperkalemia – hyperkalaemia due to blood sample haemolysis, sample taken from IV 'drip' arm, thrombocytosis or leukocytosis
- Renal - acute/chronic renal failure
- Drugs – Spironolactone/amiloride/ACEI/AII Receptor Blockers/digoxin toxicity
- Acidosis
- Intravenous K infusion (oral KCl (slow-K or chlorvescent) usually only causes hyperkalemia if there is renal insufficiency or other K retaining drugs administered)
- Mineralcorticoid deficiency
- Endogenous (tumour-lysis syndrome, rhabdomyolysis, trauma, burns)

Clinical features

- ECG – peaked T waves, prolonged PR interval, widened QRS
- Cardiac arrest
- Paresthesia, areflexia
- Muscle weakness, paralysis and constipation

Treatment

- Cease K^+ intake and K^+ retaining drugs
- Treat concomitant acidosis
- **For short term treatment of acute $K^+ \geq 6.5$ mmol/L and/or any hyperkalemia with ECG changes**

(If K^+ 6.0 - 6.5mmol/L and no ECG changes can skip step 1):

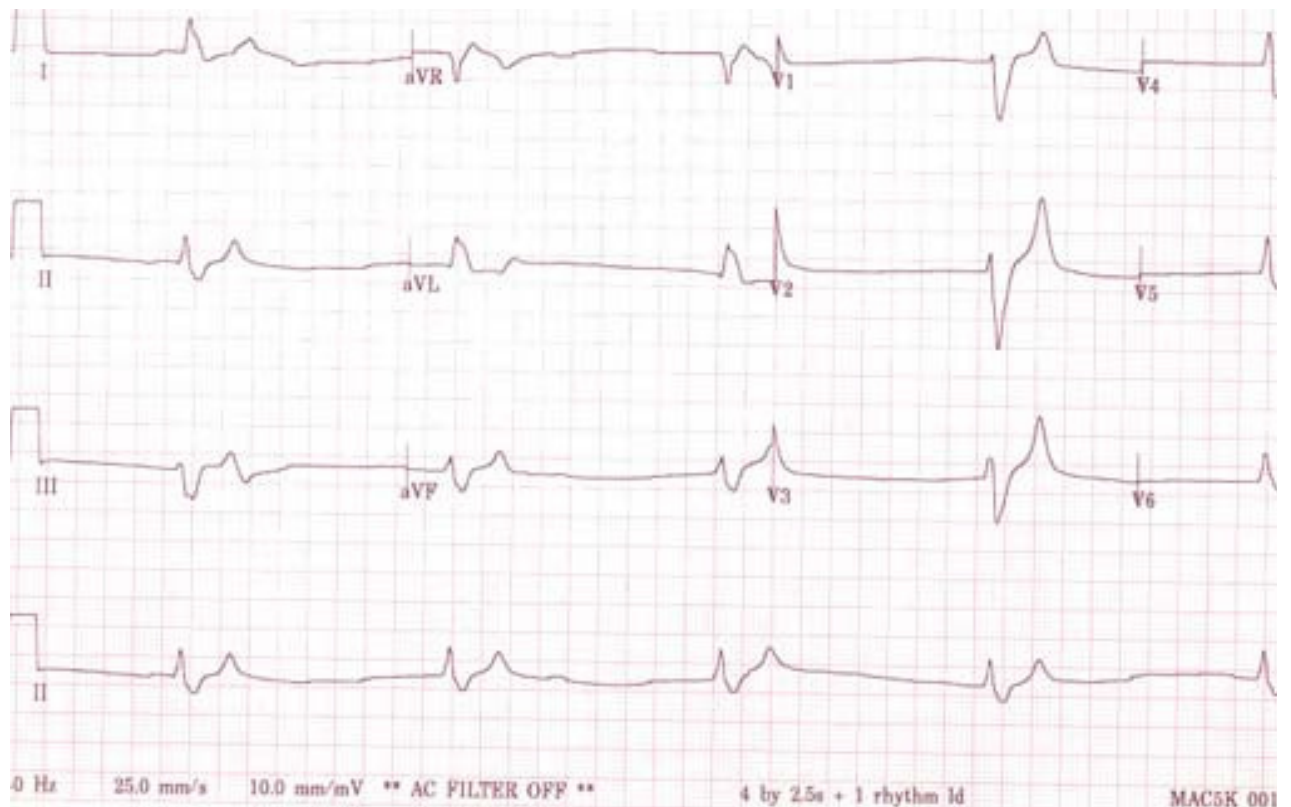
1. Ca gluconate 10 ml (10%) IV over 5 mins
2. Glucose (50 ml of 50% Dextrose) stat followed immediately by Actrapid insulin 10 units IV. Check finger prick BSL every 30mins for 2 hours
3. Salbutamol 10mg nebulized, but response has been shown to be inconsistent – this step is optional and must not be used as single agent. **Caution-** in patients with ischaemic heart disease, history of cardiac arrhythmias (increased risk of arrhythmias) and patients on β -blockers and digoxin (response attenuated).
4. Resonium A 30g orally or PR
5. $NaHCO_3$ 100 mmol IV over 30 mins (if no response to insulin or if severely acidotic and not fluid overloaded)

This should lower K^+ within 45 minutes so check serum K^+ 1 hr after treatment is given.

- Dialysis may be required - check with registrar or consultant
 - Check K^+ each 4 hrs until stable
 - Continuous ECG monitoring until K^+ and ECG return to normal.
 - Give a 2nd dose of IV Calcium if ECG still abnormal after 45 mins
- **For dialysis patients**
 - Discuss with Consultant as dialysis is usually required immediately
 - **For serum K^+ 5.6 – 6.0 mmol/L**
 - Resonium A 30g orally stat
 - Resonium 15g daily for 2-3 days then reassess
 - Low K^+ diet

ECG Examples

Hyperkalaemia before treatment



After treatment

