Hyperkalaemia

Definition

Serum K+ > 5.5mmol/l

- Medical emergency if plasma K+ ≥ 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)
- Mineralocorticoid 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+ ≥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 used as single agent. **Caution**- in patients with ischaemic heart disease, history of cardiac arrhythmias (increased risk of arryhtmias) and patients on b-blockers and digoxin (response attenuated).
4. Resonium A 30g orally or PR
5. NaHCO3 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