

Description

Potassium is the most abundant intracellular cation. Hyperkalaemia is defined as $>5.5\text{mmol/L}$.

Causes:

- ↑Intake/Absorption - potassium supplements, blood transfusion, GIT bleeding
- ↓Excretion: RF ($\text{GFR}<20\text{ml/min}$), hypoadrenalism, K^+ sparing diuretics, ACEI, spironolactone, analgesic nephropathy (NSAIDs), suxamethonium, digoxin
- ↑Release: crush syndrome, haemolysis (incl Sickle), hyperthermia, burns, tumour lysis
- Transcellular shift: acidosis, hypertonicity (incl DKA), low insulin, drugs (beta blockers, suxamethonium, theophylline, digoxin toxicity), hyperkalaemic periodic paralysis
- Spurious (pseudohyperK): haemolysed or clotted specimen, ↑↑WCC or RBC, IV drip sample

Presentation

Symptoms: Nonspecific and include weakness and fatigue. Occ muscular paralysis, palps or SOB.

Signs: Occ. bradycardia (heart block), muscle weakness/paralysis, depressed tendon reflexes

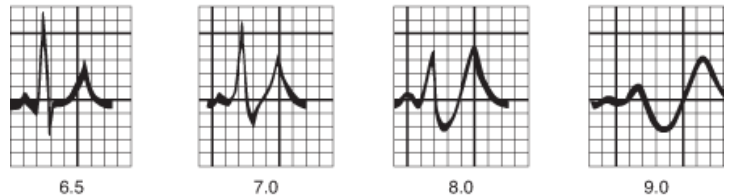
Investigations

Urine: 24 hours urine volume and electrolytes.

Blood: Rpt UEC (K, Cr, Ur), glucose, FBC (anaemia), digoxin level

ECG: onset of changes -

- K^+ 5.5-6.5mmol/L: Peaked T waves
- K^+ 6.5-7.5mmol/L: Loss of the P wave, prolongation of the PR interval
- K^+ 7.0-8.0mmol/L: Widening of the QRS
- K^+ 8.0-10.0mmol/L: Heart block, BBB, sinoventricular rhythm (sine wave pattern without P waves), VT, VF, sinus arrest, asystole



Management

Attach cardiac monitoring. Immed Mx if ECG changes or $\text{K}^+>7.0\text{mmol/L}$. Treat underlying cause.

Non-Drug

- Decrease high intake of K^+ in the diet

Drugs

- Stop any K^+ supplements or drugs that conserve K^+
- If risk/signs of cardiotoxicity: 10% **calcium chloride** 5-10ml or **gluconate** 10-30ml IV over 10min (contrary to traditional teaching, some evidence that Ca^{2+} is **not CI** if on digoxin or digoxin toxic - but give more slowly e.g. in 100ml 5% dextrose over 20min, plus **digoxin immune Fab** & **MgSO_4** 10mmol might be preferred initially if digitoxic)
- **50% dextrose** 50ml \pm 5-10u **Actrapid** IV - monitor BSL,
- 5-10mg nebulised **salbutamol**
- **Resonium** 15-30g PO or PR q4-6h
- Consider 1mmol/kg **NaHCO_3** if severe acidosis
- Fluid replacement \pm **furosemide**

Invasive Procedures

- Dialysis may be required

Prognosis

Mortality $\sim 25\%$ if $\text{K}^+>7.0\text{mmol/L}$.

Prevention

Often dangerous hyper K^+ is iatrogenic so careful prescribing & monitoring of renal fn is needed.