

Hyperkalaemia

Sept 2014

Normal concentrations

Intracellular 150 Interstitial 4.5 Plasma 4 N saline 0 Ringer's lactate 4
 80-95% reabsorbed in PCT; 0-10% in thick ascending LOH
 Hyperkalaemia defined as $>5.5\text{mmol/L}$

Causes

1. Artefact/spurious (old specimen, WCC >600 , haemolysed, iv arm, incr plt, clotted)

2. Incr intake

K supplements
 GI bleeding
 transfusion

3. Redistribution (ie. extracellular shift)

acidosis ($\text{pH}:\text{K} = 0.1:0.5$)
 tissue damage - trauma, crush, burns, rhabdo, tumour lysis, post-op, hyperthermia
 haemolysis
 drugs - digoxin OD, sux, ACEi, b blockers

4. Decr renal excretion

renal failure
 Addisons
 K⁺ sparing diuretics, CA inhibitors, NSAIDs

If anuric, K incr by 0.5/day; unlikely sole cause if Cr <0.8 ; K >5.5 uncommon until $>90\%$ renal function lost

Symptoms

NM: weakness, areflexia, ascending flaccid paralysis, paraesthesia
 GI: N+V+D, paralytic ileus

HyperK periodic paralysis

Autosomal dominant; occurs after exertion; resp involvement rare (unlike hypok); less severe than hypok PP; due to Na channelopathy; occurs with K >5.5

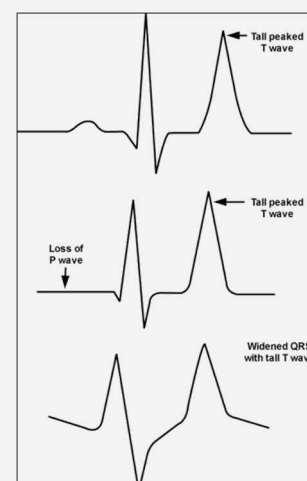
Severity of Sx depends of level of K and acuteness of rise

Investigations

U+E, BSL (?low), Ca (hypoCa potentiates arrhythmias), ABG (?acidosis), dig level

ECG

6-7: tall peaked T waves ($>5\text{mm}$)
 7-8: QRS widening, small P waves
 8-9: fusion of QRS complex with T wave - produces sine wave
 >9 : AV dissociation, VT, VT
 10-12: VF, asystole, sinus arrest/brady, CHB





Management

Urgent if: ECG changes, $K > 7$

Aims: membrane stabilisation, intracellular shift of K, removal of K from body

K 5 – 6.5:

Beta-agonist: intracellular shift Onset 15-30mins

DOA 2-4hrs

10-20mg salbutamol will decr by 1-1.5 over 30mins; can also be given IV; 5mg neb decr K by 0.2-0.4

***Ca Resonium: K excretion

Onset 1-2hrs

DOA 4-6hrs

Give 15-30g PO Q4-6hrly; be careful in fluid overload as Na load *(in guidelines but reports of bowel necrosis)*

K 6.5 – 8:

Insulin and dex: intracellular shift

Onset 15-30mins

DOA 2-4hrs

Give if $K > 6.5$; give 5-10iu actrapid after 25-50mls 50% dex

Will decr K by up to 1; care in Addison's, as may result in severe hypoG

NaHCO₃: intracellular shift

Onset 5-30mins

DOA 1-2hrs

Give if $K > 6.5$; 50-100mmol (or 1mmol/kg) over 15-30mins

K > 8

Ca Gluconate / chloride 10%: membrane stabilisation Onset 1-3mins DOA 30-60mins

Give if ECG changes other than just peaked T waves, immediately; give 10-20ml 10% Ca glu, 5ml CaCl 10% over 1-5mins; can rpt x1

Be careful if on dig, as Ca worsens dig toxicity (use FAB fragments instead)

Others

Furosemide: K excretion; Give 40mg IV

Hypertonic saline: intracellular shift; 100-200mls 3%

Dialysis: use if other measures unsuccessful or not expected to get K to < 7 within 1hr