Information for Clinicians

Clinical Biochemistry Department

Hyperkalaemia - a guide for GPs

Definition

Mild Hyperkalaemia	5.5 – 5.9 mmol/L	Needs review
Moderate Hyperkalaemia	6.0 – 6.4 mmol/L	Needs urgent review or treatment
Severe Hyperkalaemia	≥ 6.5 mmol/L	Severe, potentially life threatening – needs emergency treatment

- Renal patients may be more tolerant to hyperkalaemia but urgent action is generally needed if K ≥ 6.5 mmol/L
- Acute changes >0.5 mmol/L in 6-12 hours may be more significant than absolute values.
- The NHS Improvement alert 'Resources to support safe and timely management of hyperkalaemia' highlighted the importance of timely identification, treatment and monitoring of hyperkalaemia.

All results ≥6.5 mmol/L will be phoned by the laboratory to the requesting location or out of hours (OOH) service, consider urgent admission in these cases.

GP Acute Medical Referrals and MAU Consultant Advice Line: 07818 013823

Causes

Pseudohyperkalaemia

- Delay in reaching laboratory (consider especially if delay >6 hours)
- Refrigeration of sample prior to separation by laboratory
- Contamination with EDTA (FBC) in tube (usually identified by the laboratory)
- Thrombocytosis (in these patients using a green top lithium heparin tube is more accurate)
- Leucocytosis (in these patients using a green top lithium heparin tube is more accurate)
- Haemolysis during venepuncture or excess cuff time

Renal	• Acute kidney injury • Chronic kidney disease (especially ESRD on dialysis) • Drugs: ACE inhibitors, ARBs, NSAIDs, Spironolactone • Interstitial nephritis or tubular disease • Lack of aldosterone e.g. Addison's disease, Renal Tubular Acidosis type 4 (common is diabetes) or rarely congenital adrenal hyperplasia • Advanced CCF
Redistribution	• Acidosis e.g. Diabetic ketoacidosis • Drugs: Beta blockers, digoxin • Cell tissue breakdown, e.g. trauma, crush injury, rhabdomyolysis, haemolysis, tumour lysis, transfusion
Excess potassium	• Excess diet (usually only if concurrent renal impairment) • K supplements • K containing laxatives such as movicol

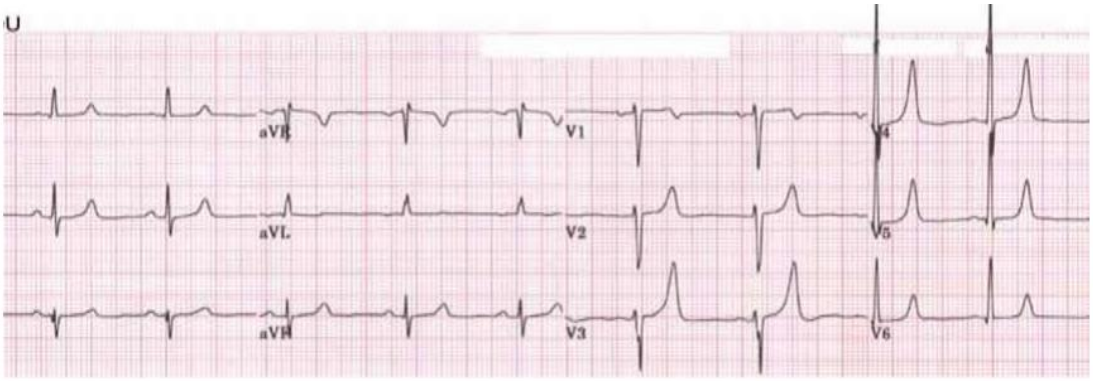
Investigations and management in Primary Care

1. Assess severity and urgency

Urgent referral to secondary care is recommended for patients with:

- K ≥6.5 mmol/L
- Acute ECG changes and K ≥5.5 mmol/L
- Acute increase >0.5 mmol/L in 6-12 hours
- All those with K ≥6.0 mmol/L should have an ECG (once pseudohyperkalaemia excluded)

ECG may show bradycardia, P waves absent or PR prolongation, peaked T waves, widened QRS, VT or VF



2. Assess trend
   - Pseudohyperkalaemia is a common cause when there is an isolated rise in potassium or unexpected potassium result, especially where there are no ECG changes, symptoms or kidney disease.
   - An urgent repeat should be arranged when K ≥ 6.0 mmol/L
   - If there is a possibility of fragile blood cells (e.g. in CLL, thrombocytosis, leucocytosis, vasculitis) send a lithium heparin (green topped) tube.
   - Check previous K results but if there is a rapid rise (K >0.5 mmol/L in 6-12 hrs) an urgent referral to secondary care should be arranged as this is associated more strongly with conduction abnormalities.

3. Assess clinical situation
   - Assess for any symptoms, which include lethargy, nausea, muscle weakness or paraesthesia.
   - ECG when K >6.0 mmol/L
   - Look for any possible causes of hyperkalaemia such as acute or chronic renal impairment, DKA, oliguria (see below).
   - Review diet for high potassium intake: banana, nuts, dried fruit, avocado.
   - Review medications

4. Investigations

Review recent results or organise appropriate tests:
- Look for evidence of renal impairment (U&E)
- Look for evidence of acidosis (venous bicarbonate)
- Look for possible diabetes (fasting glucose)
- If relevant consider DKA (urine ketones)
- Consider Addison's if there is hyponatraemia and hyperkalaemia (9am cortisol)
- Look for evidence of tissue damage (CK, LDH)
- Look for underlying condition that may increase cell fragility (FBC)

5. Monitoring

Mild Hyperkalaemia	5.5 – 5.9 mmol/L	Repeat within 1 week Review medications & diet for causes
Moderate Hyperkalaemia	6.0- 6.4 mmol/L	Recheck ASAP If ECG changes admit Stop medications that may elevate K
Severe Hyperkalaemia	≥6.5 mmol/L or if ECG changes are present	Urgent repeat: Admit

The urgency of assessment and frequency of potassium monitoring will depend on individual circumstances.

6. Patiromer (Veltassa)

Patiromer is a **red drug** on the formulary but recommended by NICE (TA623) as an option for treating hyperkalaemia in adults only if used:

- in emergency care for acute life-threatening hyperkalaemia alongside standard care or
- for people with persistent hyperkalaemia and stages 3b to 5 chronic kidney disease or heart failure, if they:
    - have a confirmed serum potassium level of at least 6.0 mmol/L and
    - are not taking, or are taking a reduced dosage of, a renin-angiotensin-aldosterone system (RAAS) inhibitor because of hyperkalaemia and
    - are not on dialysis.

Reference Sources

1. Patient Safety Alert – Resources to support safe and times management of hyperkalaemia, NHS Improvement (2018)
2. Treatment of Acute Hyperkalaemia in Adults, The Renal association (2014)
3. Pathogenesis, diagnosis and management of Hyperkalaemia, Lehnhardt and Kemper. 2010
4. CREST Guideline for treatment of hyperkalaemia in adults. 2005.
5. Best practice in primary care; review. Smellie. J Clinical Pathology. 2007
6. A primary care approach to Na & K imbalance 2011. Kyle . BPAC

Further sources of Information

For further advice regarding hyperkalaemia please contact the duty biochemist on 01225 824050 Monday –Friday 9am-5pm.