



Magnesium

Sept 2014

Effects of Magnesium

Natural calcium channel antagonist
Vasodilator
Smooth muscle relaxation
Anti-arrhythmic

Hypomagnesaemia

35% patients with CCF on diuretics, 40% patients with hypokalaemia

Causes

GIT- poor nutrition, malabsorption
Renal - alcohol, diuretics, aminoglycosides, ciclosporin, hyperaldosteronism
Endocrine - hyperthyroidism, hyperparathyroidism

Clinical

<0.5 mmol/l: tetany, seizures, arrhythmias, neuromuscular irritability
plus symptoms of hypokalaemia and hypocalcaemia

Investigations

24 hr urine magnesium (<0.5 normal, >1.0 renal wasting)
ECG: risk of AF and SVT after AMI, increases effects of digoxin toxicity, prolonged QT, risk torsades

Management

iv replacement or oral replacement (may cause diarrhoea)

Hypermagnesaemia

Causes

Usually iatrogenic, most common in children - enemas, antacids
Usually associated with renal failure (can't excrete)

Clinical

>3.0: N/V/flushing
>4.0: decreased DTRs, drowsy, unsteady
>5.0: ECG changes (QRS widening, PR prolongation)
>6.0: stupor, hypotension, bradycardia
>10: absent reflexes, muscle paralysis
>15: heart block, apnoea
Also causes hypocalcaemia due to suppression of PTH secretion

Management

Remove exogenous magnesium
Give calcium
iv fluids + frusemide
Consider dialysis if renal failure



Uses of magnesium

1. Torsades (2g iv bolus. Remember to treat cause, replace K, overdrive pacing, calcium)
2. Digoxin toxicity
3. Pre-eclampsia/Eclampsia (40mmol over 15 mins)
4. Asthma (severe, not responding to other treatments. 1-2g over 20mins then 2g/hr)
5. AF (10mmol over 20 mins)
6. Irukandji Syndrome (pain refractory to opioids, same dose as eclampsia)
7. Resistant hypokalaemia
8. Symptomatic hypomagnesaemia and $Mg^{2+} < 0.5 \text{ mmol/L}$

1g = 4mmol = 8meq

1 Ampoule = 10mmol = 2.47g

Dose: 10mmol over 10-15mins for emergency indications

Faster for life-threatening arrhythmias

Adverse effects

Flushing, Hypotension, Bradycardia, Muscular paralysis – check reflexes, May precipitate VF from VT