

Management of Acute Hypomagnesaemia in cancer patients

CAUSES:

Patients receiving **CHEMOTHERAPY** particularly:

Cisplatin (commonest cause, may be cumulative effect), oxaliplatin, carboplatin, cetuximab, panitumumab

Other Causes: diarrhoea, nausea + vomiting, malabsorption, malnutrition, drugs (e.g. amphotericin B, gentamicin, diuretics, omeprazole, lansoprazole, ciclosporin, tacrolimus), renal tubular defects, chronic alcoholism

Often associated with other electrolyte abnormalities, such as hypocalcaemia or hypokalaemia

SYMPTOMS/SIGNS:

May be asymptomatic – with diagnosis only made on routine blood test

Symptoms usually occur if serum $Mg^{2+} < 0.5\text{mmol/l}$

Neuromuscular: muscle weakness, carpopedal spasms progressing to tetany, muscle cramps and fasciculation, +ve Chvostek sign, +ve Trousseau signs, decreased reflexes.

Neurological: tremor, spasticity, agitation confusion, convulsions, ataxia, delirium, depression, psychosis

Cardiovascular: ventricular arrhythmias, prolonged QTc interval

Investigations:

Bloods (U&E, Ca^{2+} , Mg^{2+}) +/- cardiac monitoring / ECG

Grade 1 Hypomagnesaemia $Mg^{2+} < 0.7$ to ≥ 0.5 mmol/l

No intravenous replacement needed, as patients typically asymptomatic.*

Oral supplements may be required, particularly if the patient is symptomatic, and after considering the risks and benefits – note that oral supplements may cause diarrhoea and are not well absorbed:

Magnesium glycerophosphate 4mmol chewable tablets; 2 tablets three times daily

or

Magnesium aspartate 10mmol sachets; 1 sachet once or twice daily

Review other medication; e.g. consider stopping any PPI (switch to ranitidine) or diuretic

*However;

a) if patient is receiving an IV cytotoxic associated with low magnesium (see above), consider administering an IV infusion of 20mmol magnesium sulphate ($MgSO_4$) in 250ml 0.9% NaCl over 1 hour, while cannulated and attending for IV chemotherapy

(N.B. 20mmol $MgSO_4$ already included in cisplatin pre-and post-hydration)

or

b) if patient is also hypocalcaemic, consider correcting the low Mg intravenously and orally

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Grade 2 Hypomagnesaemia $Mg^{2+} < 0.5$ to ≥ 0.4 mmol/l

Intravenous replacement required:

Magnesium sulphate 5g (20mmol) in 250ml 0.9% NaCl IV over at least 1 hour *

Monitor blood pressure, respiratory rate and urinary output throughout magnesium infusion.

A slower rate, over 6 – 12 hours, should be used for in-patients (if also requiring IV fluids, can add dose to up to a 1L bag of compatible fluid)

Repeat doses may be required – check Mg^{2+} , Ca^{2+} , K^+ at least once a week

Maximum 40mmol IV $MgSO_4$ in first 24 hour period (if CrCl < 60ml/min, max 20mmol)

Maximum 20mmol IV $MgSO_4$ per 24 hours if administered daily (if CrCl < 60ml/min, max 10mmol/24hrs)

Then consider need for oral supplementation, as for Grade 1 hypomagnesaemia

If concurrent hypokalaemia: correct according to local Trust guidelines for potassium replacement

If also hypocalcaemic: continue to correct Mg^{2+} level until corrected Ca^{2+} in normal range

***CARE:** If infused too rapidly, symptoms include hypotension, respiratory depression, drowsiness and confusion, bradycardia, coma and cardiac arrest

Grades 3 – 4 Hypomagnesaemia $Mg^{2+} < 0.4$ mmol/l

Risk of cardiac arrhythmias; admit for continuous cardiac monitoring.

If no arrhythmia:

Treat initially as for Grade 2 above.

Repeat magnesium infusions for up to 3-5 days until serum Mg^{2+} normal, and then consider need for oral supplementation

Check Mg^{2+} , Ca^{2+} , K^+ daily

If cardiac arrhythmia:

EMERGENCY - REFER urgently to medical SpR

ONLY with continuous ECG monitoring, $MgSO_4$ 20mmol in 100mls 0.9% NaCl or 5% glucose may be infused over 20 minutes*

***CARE:** If infused too rapidly, symptoms include hypotension, respiratory depression, drowsiness and confusion, bradycardia, coma and cardiac arrest

References: In line with RSCH Trust guidelines for hypomagnesaemia
UKMI Q&A; How is acute hypomagnesaemia treated in adults? July 2017

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