

# Magnesium Imbalance

Normal magnesium is 0.7 to 1.0 mmol / l. Half is in the form of free cations. Magnesium is essential for the transmission of nerve impulses and for muscle contraction. It is a typical cation of ICT , where it is located in more than 95%. It is crucial in the homeostasis of potassium and calcium .

## Hypomagnesemia

[🔗 edit embedded article] Video in English, definition, pathogenesis, symptoms, complications, treatment. We indicate magnesium hypomagnesaemia <0.7 mmol / l.

### Pathophysiology

Hypomagnesemia reduces PTH secretion and inhibits the bone response to PTH and therefore leads to hypocalcemia . This hypocalcemia is resistant to treatment until we correct the reduced levels of magnesium in the blood. Hyperexcitability of the neuromuscular system is manifested by a decrease in magnesium <0.5 mmol / l. Magnesium deficiency leads to hypocalcemia and hypokalaemia , which cannot be treated with calcium or potassium alone .

### Etiology

- Kwashiorkor ;
- malabsorption syndromes ;
- catabolism;
- long-term parenteral nutrition ;
- diarrhea ;
- premature babies ;
- urinary Mg loss: Conn's syndrome , Bartter's syndrome , RTA , diuretic therapy ;
- tubulointerstitial nephritis of toxic origin.

### Clinical picture

Hypomagnesemia is manifested similarly to hypocalcemia with latent or manifest tetany, tremor, convulsions. We can observe personality changes, nausea , vomiting , anorexia. On the ECG we find a prolongation of the QT interval.

### Therapy

The treatment consists of supplying magnesium in infusions. We administer 10% MgSO<sub>4</sub> (1 ml = 0.4 mmol magnesium) at a dose of 0.2 to 0.5 ml / kg slowly iv with confirmed hypomagnesemia <0.5 mmol / l. However, the need for magnesium is very difficult to estimate. The importance of magnesium administration in the treatment of hypokalaemia and hypocalcaemia should be borne in mind (especially if administration of calcium in hypocalcaemia does not lead to an adjustment of clinical symptomatology!).

## Hypermagnesemia

[🔗 edit embedded article] Hypermagnesemia (video in English) Hypermagnesemia is a magnesium value > 1.0 mmol / l. Hypermagnesemia is a rarity in children and increased magnesemia could be present in renal failure , adrenal insufficiency and in neonates whose mothers were treated with magnesium salts for eclampsia before delivery . In newborns, the symptoms include muscle hypotension, decreased tendon reflexes, bradycardia , apnea , and delayed pitch emptying .

### Therapy

*Treatment is usually not necessary* . We will stop the supply of magnesium. In severe cases, 10% Calcium gluconicum (1 ml = 0.2 mmol) 0.5 to 1.0 ml / kg or 10% Calcium chloratum (1 ml = 1 mmol) 0.1 to 0.2 ml / kg iv within 10 minutes (maximum single dose is 10 mmol). At the same time, we monitor the heart rate (there is a risk of bradycardia with rapid administration).

Another option is to administer furosemide 1 mg / kg iv or corticoids (prednisone 1 mg / kg). In extreme cases, hemodialysis .

## Links

### Source

- HAVRÁNEK, Jiří: *Dysbalance magnesie* . (managed)

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