

What causes magnesium deficiency?

“A poor supply of magnesium is associated with an increased risk of numerous diseases, including metabolic syndrome, type 2 diabetes mellitus and cardiovascular diseases,” according to the authors of a position paper published in November 2020 by the Society for Magnesium Research.¹ The experts from the Society for Biofactors agree with this statement and warn urgently against the negative health consequences of magnesium deficiency.

What depletes the body of magnesium?

A **magnesium deficiency** can be caused by an insufficient intake of the **biofactor** through the **diet**. In specific life situations such as during pregnancy and lactation, as well as in the case of high stress, the magnesium requirement increases. Alcohol abuse inhibits magnesium absorption and increases its excretion via the kidneys. The intake of numerous **medicines**² also leads to increased renal magnesium excretion. In chronic intestinal diseases such as Crohn’s disease, ulcerative colitis and coeliac disease or after intestinal surgery, magnesium absorption may be impaired, while chronic diarrhoea and laxative abuse increase magnesium excretion through the intestine. Due to absorption and reabsorption deficiencies in the kidneys, magnesium deficiency can also have a genetic cause in 0.1 to 1% of the population.³ Last but not least, according to scientific studies, approximately 50% of type 2 diabetics suffer from magnesium deficiency.⁴

What are the symptoms of magnesium deficiency?

A magnesium deficiency is often found in cardiovascular diseases such as high blood pressure, cardiac insufficiency and cardiac arrhythmias, while – conversely – oral **magnesium** supplementation has a positive influence on these diseases.^{5,6} In addition to the effects on the cardiovascular system, a magnesium deficiency can lead to muscle tension and muscle cramps.^{7,8} Furthermore, magnesium supplementation can protect against osteoporotic fractures in cases of proven deficiency.⁹ Studies have also shown that magnesium deficiency not only increases the risk of suffering from diabetes, but also makes it more difficult for diabetics to adjust their blood sugar. Magnesium can positively influence the sugar metabolism and improve insulin sensitivity.¹⁰

Last but not least, a magnesium deficiency should be considered in the case of non-specific symptoms such as insomnia, poor concentration, nervousness, restlessness, tension headaches, confusion or depression.

How can magnesium deficiency be detected?

The optimum magnesium concentration in the blood serum is above 0.80 mmol per litre.^{11,12} Nevertheless, the diagnosis is not only based on this laboratory value, but above all on the investigation of the **magnesium deficiency symptoms**. Reason: Since only about 1% of the body’s magnesium is in the blood – and 60% in the bones and 39% in the muscles and organs – the body releases this biofactor from bones or muscle cells in the case of magnesium deficiency in order to keep the magnesium content of the blood constant. Normal blood values do not therefore rule out magnesium deficiency.

Conclusion of the Society for Biofactors

Due to the importance of this biofactor in the **prevention and therapy** of numerous diseases, attention should be paid to ensuring an optimal magnesium status. Any deficiency should be clarified on the basis of the symptoms and laboratory diagnostics and, in the case of a positive finding, compensated for by targeted supplementation. Here it is important to take into account the fact that organic compounds such as **magnesium orotate** are usually better tolerated and more bioavailable than inorganic compounds.^{13,14,15}

Bibliography:

- ¹ Micke O et al.: Magnesium: Bedeutung für die hausärztliche Praxis. (Significance for GP practice) Dtsch Med Wochenschr 2020, J45: 1628-1634
- ² Gröber U, Schmidt K, Kisters K: Magnesium in prevention and therapy. Nutrients 2015, 7(9): 8199-8226
- ³ Weber S et al.: Angeborene Magnesiumverlustkrankungen. (Congenital magnesium loss disorders) Dtsch Ärztebl 2002, 99: 1023-1028
- ⁴ Corica F et al. Serum ionized magnesium levels in relation to metabolic syndrome in type 2 diabetic patients. J Am Coll Nutr 2006, 25: 210-215
- ⁵ Zhang X et al.: Effects of magnesium supplementation on blood pressure. A meta-analysis of randomized double-blind placebo-controlled trials. Hypertension 2016
- ⁶ Stühlinger HG: Die Bedeutung von Magnesium bei kardiovaskulären Erkrankungen. (The importance of magnesium in cardiovascular diseases) J Kardiol 2002, 9(9): 389-395
- ⁷ Roffe C et al.: Randomised cross-over placebo-controlled trial of magnesium citrate in the treatment of chronic persistent leg cramps. Med Sci Monit 2002; 8(5)
- ⁸ Supakatisant C et al.: Oral magnesium for relief in pregnancy-induced leg cramps: a randomised controlled trial. Maternal & Child Nutrition 2012
- ⁹ Veronese N et al.: Dietary magnesium intake and fracture risk: data from a large prospective study. British Journal of Nutrition 2017 Jun, 117(11): 1570-1576
- ¹⁰ Rodriguez-Moran M et al.: Oral magnesium supplementation improves insulin sensitivity and metabolic control in type-2 Diabetic subjects: a randomized double-blind controlled trial. Diabetes Care 2003, 26(4): 1147-1152
- ¹¹ Spätling L et al.: Diagnostik des Magnesiummangels. Aktuelle Empfehlungen der Gesellschaft für Magnesium-Forschung e. V.. (Diagnosis of magnesium deficiency. Current recommendations of the Society for Magnesium Research) Fortschritte der Medizin 2000, 118: 49-53
- ¹² Workinger JL et al.: Challenges in the diagnosis of magnesium status. Nutrients 2018, 10: 1202 ff
- ¹³ Walker AF et al.: Mg citrate found more bioavailable than other Mg preparations in a randomised, double-blind study. Magnes Res 2003 Sep, 16(3): 183-91
- ¹⁴ Stepura OB et al.: Magnesium orotate in severe congestive heart failure (MACH). Int J Cardiol 2009, 131: 292-295
- ¹⁵ Kisters K et al.: Positive effect of magnesium orotate therapy in hypertensive heart disease. Nieren- u. Hochdruckkrankheiten 2016, 45: 1-6