Magnesium and Calcium: Teammates and Opponents

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So-called “calcium antagonists” are frequently used to treat hypertension and heart disease - but they do not cause calcium deficiency and their intake does not lead to osteoporosis (brittle bones). A distinction is made between “synthetic” and **the** “natural” calcium antagonist, magnesium. However, this “opposing function” of calcium and magnesium ions only occurs in tissues with ion channels through which stimulation occurs, i.e. for example in the heart or the striated and smooth muscles, or in blood clotting.

The uptake of magnesium and calcium from the intestine occurs by means of different transport systems; mutual prevention of absorption can only be demonstrated experimentally if unrealistically high quantities are administered. For this reason alone, both minerals can be administered simultaneously in principle.

How closely the magnesium and calcium metabolisms are linked to one another is shown by experiments with alimentary magnesium deficiency, as well as the clinical picture of “calcium-resistant hypomagnesaemia hypocalcaemia”: in both cases the patient suffers from magnesium deficiency and at the same time hypocalcaemia (reduced calcium concentration in the blood) in spite of an adequate supply of calcium - with all signs of tetany such as cramps in the fingers, arms and legs, angina pectoris etc. After an intravenous “calcium injection” the symptoms only abate for a short time. However, if magnesium is also administered - or exclusively - the condition improves permanently. This phenomenon can be explained by the fact that important steps in the calcium balance are magnesium-dependent: for example, the conversion of vitamin D to vitamin D3, which is required for calcium absorption from the intestine, as well as the release of parathyroid hormone from the parathyroid gland and its contact point in the skeleton: parathyroid hormone physiologically counteracts a drop in serum calcium. Similar synergistic hormonal effects in the bone also explain how the sufficient supply of magnesium in elderly women can stop bone loss (osteoporosis).

Finally, divalent calcium and magnesium ions seal biological membranes through the formation of “bridges”, so to speak. This explains the favourable synergistic effects in allergic diseases such as hay fever.

The bottom line of all of this is that it is necessary to provide the body with sufficient quantities of both minerals. A magnesium deficit should be avoided, as it causes secondary electrolyte disturbances - including calcium homoeostasis.