

Magnesium: a cation still forgotten in clinical practice!

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Abstract

Magnesium is among the trace elements that play a crucial role in the proper functioning of the body, it has long occupied a place of «forgotten cation» in medicine, in the absence of solid knowledge about its physiology and its potential therapeutic uses.

In this article we report the results of recent data concerning its involvement in different biological functions.

Introduction

Magnesium (Mg) is classified as an alkaline earth metal, belonging to the second group of the periodic table of elements. It is the most common divalent intracellular cation and the second most abundant intracellular cation after potassium, it is not synthesized within the body, it is an external contribution only.

Magnesium is the «star of the minerals». Indeed, it plays a structural role in the cell membrane and participates in various metabolic mechanisms as a cofactor of over 300 enzymes. It intervenes in immunity and allows a better resistance to cold. Finally,

it contributes to the transmission of nerve impulses and to muscle relaxation, by relaxing the muscles (both those of the skeleton and those of the blood vessels and gastrointestinal tract) [1].

Milk and its dairy products are among the most important foods in the human diet. It is the first food for mammals and provides all the necessary energy and nutrients to ensure proper growth and development, being crucial in respect to bone mass formation [1].

It has long occupied a place of «forgotten cation» in medicine, in the absence of solid knowledge about its physiology and its potential therapeutic uses.

However, it has been the subject of renewed interest in recent years, with numerous publications focusing on its role in many areas: prevention of muscle cramps, involvement in certain cardiovascular risk factors, neuroprotection, bone health and endocrine function.

Magnesium and human health :

It has been reported that low magnesium levels can promote endothelial cell dysfunction, potentially increasing the risk of atherosclerosis and thrombosis. Several recent studies have shown that increasing magnesium intake reduces the risk of developing metabolic syndrome. Several epidemiological studies have shown that a diet low in magnesium increases the risk of developing cancer, which proves its importance in the field of hematology and oncology [1].

Magnesium and endocrine function :

Mg contributes to the regulation of thyroid hormones, not only stimulates the thyroid gland to produce more T4, but at the same time it converts T4 into T3 which is the active form of thyroid hormone [2].

It has recently been shown that magnesium plays an important role in the synthesis and activation of vitamin D (a fat-soluble pro-hormone). In fact, the presence of magnesium is necessary for the functioning of the enzymes involved in the two hepatic and renal hydroxylations of vitamin D [3].

Magnesemia: unreliable indicator in clinical practice?

Serum magnesium is a poor indicator of intracellular magnesium. Patients with normal values may well be magnesium deficient, just as hypomagnesemia may be accompanied by a normal amount of magnesium in the body.

The colorimetric techniques used in clinical practice for the determination of Mg pose a problem of reliability of results on a global scale.

Conclusion

Magnesium is a trace element that plays a key role in several biological functions in the body. However, the number of epidemiological studies that have investigated Mg deficiency remains very low on a global scale. More importance should be given to the study of Mg especially in the field of research, a revision of opinion is urgently needed.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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