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Oral Magnesium supplementation in children with cystic fibrosis improves clinical and functional variables

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Magnesium (Mg) is essential in a wide variety of cellular activities and metabolic pathways, acting as a cofactor in hundreds of enzymatic reactions in the human body. Current dietary surveys show that the average Mg intake in Western countries is often below the RDA which has raised concern about the health effects of Mg deficiency. Mg depletion has been associated with atherosclerosis, cardiovascular disorders, diabetes mellitus, metabolic syndrome and asthma.

Patients with cystic fibrosis (CF) may have Mg deficiency, even though a previous study did not find any reduction in serum Mg concentrations in these patients. Mg is an intracellular ion, and there is only a small correlation between serum and intracellular concentrations of Mg, probably because only 1% of the body's Mg store is found in blood.

In the last decade, there have been increasing concerns with biochemical studies of Mg, its nutritional relevance, its potential participation in human diseases, and particularly with the pathogenesis of pulmonary disorders.

A promising new strategy in patients with CF could be increasing the Mg concentration in the airway surface liquid by aerolisation of Mg solutions or by oral intake of Mg supplements, which may facilitate the removal of highly viscous mucus in chronic lung disease by activating endogenous DNase activity. Furthermore, there is evidence that the use of oral magnesium in children with CF is associated with improvement in clinical and functional variables.

The mechanism for a beneficial effect of Mg in CF patients is not completely clear. Mg has a variety of functions, including acting as a co-factor for sodium, potassium-ATPase, which is responsible for maintaining muscle membrane potential and action potential propagation. Deficiencies can result in muscle weakness and cramping. It is also a co-factor in over 300 enzymatic reactions and deficiency is linked with oxidative stress.

Biography

Clésio Gontijo Amaral has completed his Ph.D at the age of 44 years from The Federal University of Minas Gerais, Postgraduate Program in Health Sciences. He is the Director of the Multidisciplinary team of Nutritional Therapy of the Regional Hospital of Betim. He has published some papers in reputed journals, involving the magnesium's effect in children and adolescents with pulmonary disorders. He is researcher at the Diagnostic Support Action and Research Center (NUPAD) at the Federal University of Minas Gerais.