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REVIEW

Important drug-micronutrient interactions: A selection for clinical practice

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ABSTRACT

Interactions between drugs and micronutrients have received only little or no attention in the medical and pharmaceutical world in the past. Since more and more pharmaceutics are used for the treatment of patients, this topic is increasingly relevant. As such interactions - depending on the duration of treatment and the status of micronutrients - impact the health of the patient and the action of the drugs, physicians and pharmacists should pay more attention to such interactions in the future. This review aims to sensitize physicians and pharmacists on drug micronutrient interactions with selected examples of widely pescribed drugs that can precipitate micronutrient deficiencies. In this context, the pharmacists, as a drug expert, assumes a particular role. Like no other professional in the health care sector, he is particulaly predestined and called up to respond to this task. The following article intends to point out the relevance of mutual interactions between micronutrients and various examples of widely used drugs, without claiming to be exhaustive.

KEYWORDS

Micronutrient; drug; interactions; proton pump inhibitors; vitamin B12; magnesium; Metaformin; thiazide diuretics; statins; selenium; vitamin D; coenzyme Q10

Drugs and micronutrients

Drugs and micronutrients use the same transport and metabolism pathways in the body for their intestinal absorption, metabolism, and elimination. This means that when one or more drugs are taken, there is always a potential risk of interactions with the nutrient status.

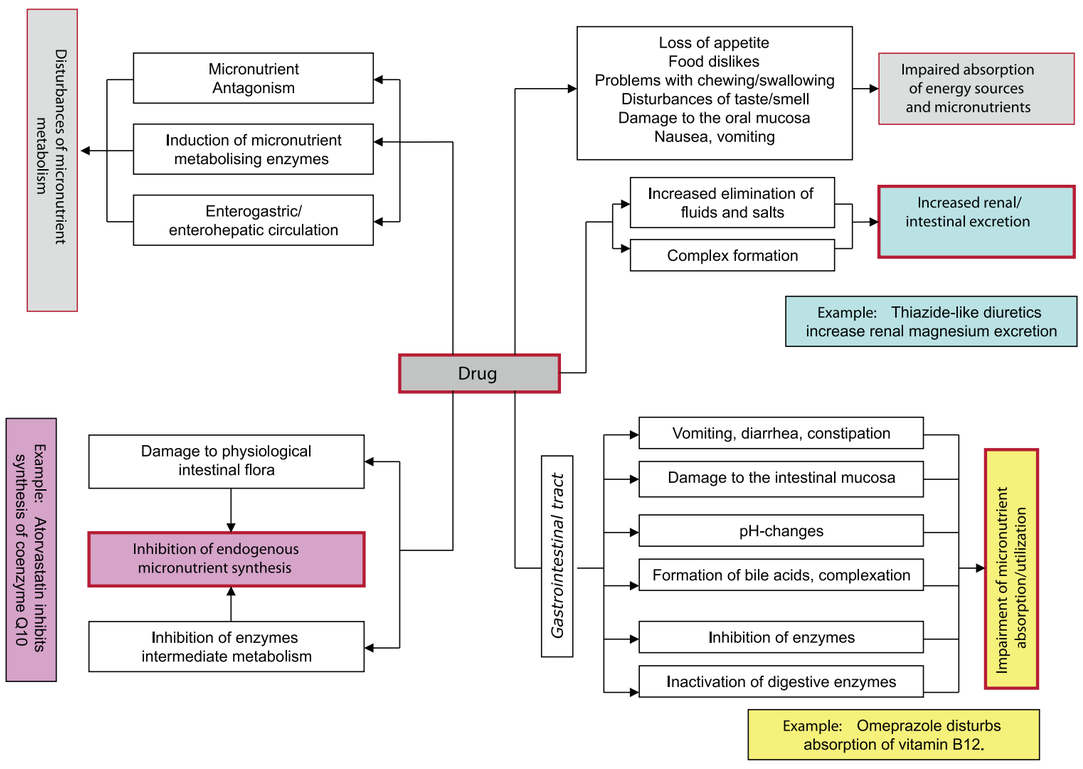
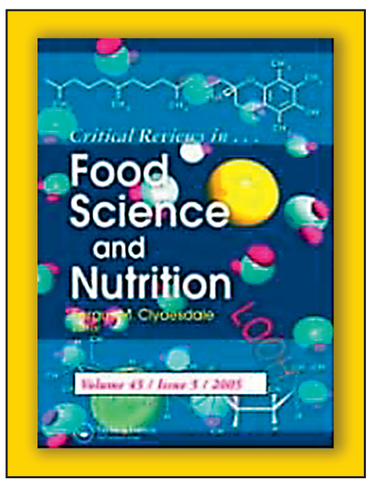


Figure 2 : Disruption of micronutrient status by drugs (Gröber et al. 2006; Gröber 2009)



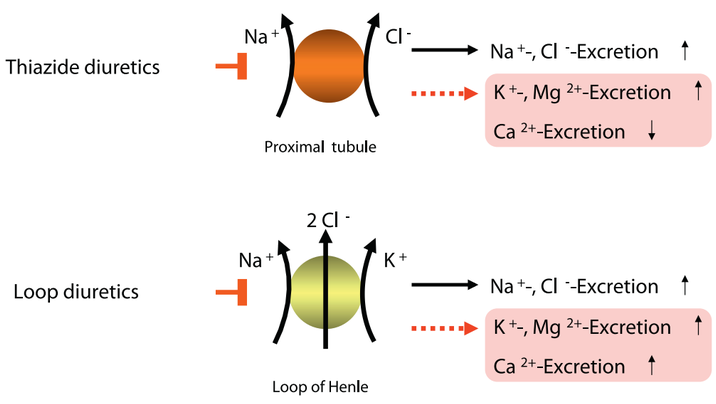


Figure 4: Electrolyt disorders by thiazides and loop diuretics (Gröber 2010)

Micronutrients have major impact on health

Vitamins and other micronutrients have considerable potential in the prevention and treatment of diet-related diseases. In general, micronutrient is the umbrella term used to mark essential vitamins, minerals and trace elements required from the diet to sustain virtually all normal cellular and molecular functions. It is widely recognized that micronutrient deficiencies are a significant public health problem.

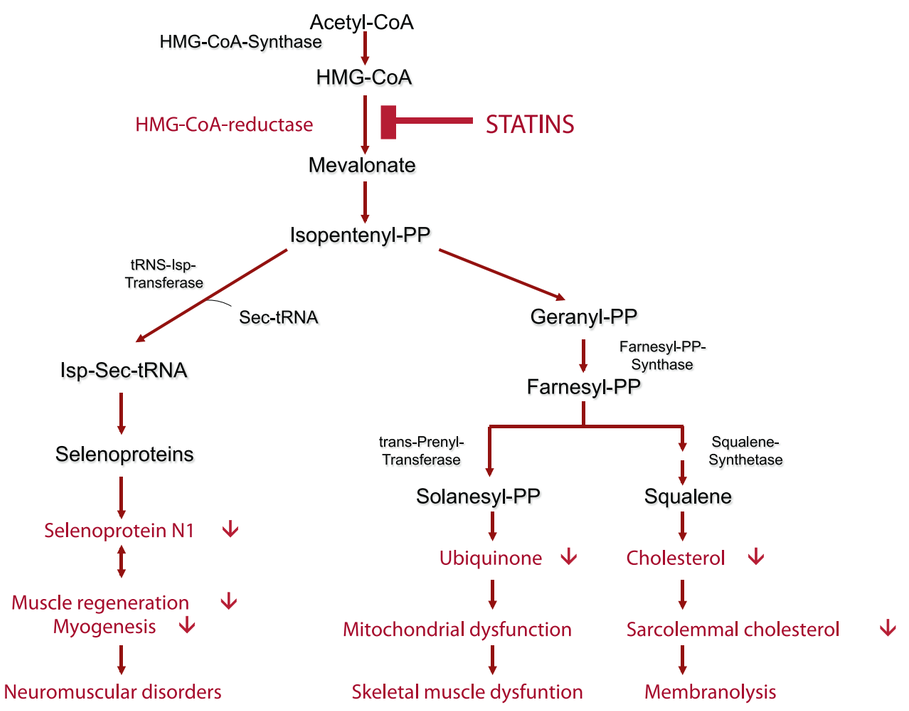


Figure 5: Statins interfere with the mevalonate pathway (Stroes et al. 2015; Ramachandran and Wierzbicki 2017; Moosmann und Behl 2004)

Recommendation for clinical practice: Although previous results of vitamin D treatment of SAMS from randomized trials have produced mixed results, Vitamin D deficiency is common in statin users and evident in European population at prevalence rates that are concerning. Therefore vitamin D status (25(OH)D, ng/mL) should be monitored in all statin- treated patients and compensated by adequate vitamin D supplementation (e.g., 40–60 IU vitamin D per kg body weight per day, 25(OH)D target value: 40–60 ng/mL or 100–150 nmol/L). This applies, in particular to patients with cardiovascular diseases, diabetes, the elderly (> 60 years) with poor nutritional status, and statin treated patients with muscular disorders (Cashman et al. 2016).

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