Vitamins and minerals in control of serious diseases?

We all know that vitamins and minerals are important, but why? The amino acid L-tryptophan is "essential" for mammals, and it must be obtained in the form of food. L-tryptophan can be utilized for protein synthesis, and also for the biosynthesis of the vitamin niacin, serotonin and melatonin. Dysregulations of L-tryptophan metabolism may play an important role in the pathophysiology of irritable bowel syndrome, Alzheimer's disease, Huntington's disease, Parkinson's disease, AIDS-dementia complex, schizophrenia, epilepsy, depression, and the aging process.

Tryptophan metabolism along the niacin pathway and serotonin pathway.

L-tryptophan metabolism is under the tight control of inflammatory mediators and is sensitive to changes in the concentration of B group vitamins (B₂, B₆) as well as micro- (Fe³⁺, Mn²⁺, Zn²⁺, Cu²⁺, Co²⁺) and macro-elements (Mg²⁺). Vitamin B₆ was found to be the most crucial vitamin engaged in L-tryptophan metabolism, since it is involved in the proper production of serotonin as well as niacin.

Deficiencies, rather than surpluses, of B-group vitamins seem to influence niacin production. However, the administration of minerals in a normally balanced diet is not known to influence L-tryptophan metabolism. Tryptophan-rich diet and maintenance of adequate B vitamins and minerals is important for patients susceptible to depression, diabetes, post-traumatic stress disorder, chronic pain, cancer, and drug addiction. It is therefore reasonable to assume that nutrients that affect the enzymes involved in the metabolism of the amino acid L-tryptophan are useful tools that may influence the progression of some serious diseases.

Michal Majewski
Department of Pharmacology and Toxicology, Faculty of Medical Sciences
UWM, Poland
Publication

Overview of the role of vitamins and minerals on the kynurenine pathway in health and disease.
Majewski M, Kozlowska A, Thoene M, Lepiarczyk E, Grzegorzewski WJ.
*J Physiol Pharmacol.* 2016 Feb