

Clinical Update

Vitamin insufficiency may accelerate age-related diseases

Current recommendations for vitamin K are not being met, placing people at increased risk of age-related diseases such as cancer and heart disease, says a new analysis.

(American Journal of Clinical Nutrition, October 2009)

A new analysis of data from hundreds of published articles dating back to the 1970's by Joyce McCann, PhD, and Bruce Ames, PhD, from Children's Hospital Oakland Research Institute also suggests that current recommendations for vitamin K intakes need to be increased to ensure optimal health. Current recommendations are based on levels to ensure adequate blood coagulation, but failing to ensure long-term optimal levels of the vitamin may accelerate bone fragility, arterial and kidney calcification, cardiovascular disease, and possibly cancer.

The findings, published in the October 2009 issue of the *American Journal of Clinical Nutrition*, strongly support Dr Ames' triage theory, first mooted in 2006. The theory may have important implications for determining the optimum intake of all vitamins and minerals, as well as major implications for preventive medicine.

Dr Ames first proposed his triage theory in 2006 (*PNAS*, Vol. 103, Pages 17589-94) to explain why age-related diseases like heart disease, cancer, and dementia may be unintended consequences of mechanisms developed during evolution to protect against episodic vitamin/mineral shortages. Since natural selection favours short-term survival over long-term health, Dr Ames hypothesised that this short-term survival was achieved by prioritising the allocation of these scarce micronutrients.

"If this hypothesis is correct, micronutrient deficiencies that trigger the triage response would accelerate cancer, aging, and neural decay but would leave critical metabolic functions, such as ATP production, intact," explained Dr Ames in the Proceedings of the National Academy of Sciences. Applying the theory to vitamin K, the researchers used mice with inactivated versions of the 16 known vitamin K-dependent proteins. They found that five of these proteins required for coagulation had critical functions, meaning that inactive forms were lethal.

On the other hand, five proteins were less critical, and the animals survived through weaning. However, genetic loss of these less critical vitamin K-dependent proteins, inadequate intakes of vitamin K1 from the diet, vitamin K deficiency, and human polymorphisms or mutations were all associated with age-related conditions, including weaker bones and hardening of the arteries, which increased the risk of cardiovascular disease. An increase in the incidence of spontaneous cancer was also observed.

The vitamin is less well known than vitamins A to E. Vitamin K has long been linked to blood health because about half of the 16 known proteins that depend on the vitamin are necessary for blood coagulation.

There are two main forms of vitamin K: phyloquinone (vitamin K1) and menaquinones (vitamins K2). K1 is found in green leafy vegetables such as lettuce, broccoli and spinach, and makes up about 90% of the vitamin K in a typical Western diet. K2 makes up about 10% of consumption and can also be obtained from the dietary sources like animal meat, and fermented food products like cheese, and natto. Multivitamins contain either small amounts or no vitamin K at all.

Source: www.nutraingredients.com

