

Maximum Wellness – 5.13.2020

Immune Update – How Your Defense Fights & Nutrients That Support

In January of 2020, A Review of Micronutrients and the Immune System – Working in Harmony to Reduce the Risk of Infection, was published in the online, peer review journal Nutrients. How prophetic that such a review would turn out to be critical three months later, with the worldwide onset of the pandemic – Covid-19.

Researchers from the Linus Pauling Institute, Department of Biochemistry and Biophysics, Oregon State University and Bayer Consumer Care AG in Switzerland, comment in the Review that, “immune support by micronutrients is historically based on vitamin C deficiency and supplementation in scurvy in early times.”

Scurvy, a disease caused by vitamin C deficiency, causes swollen, bleeding gums, opening of previously healed wounds, weakness, feeling tired, with sore arms and legs- along with decreased red blood cells, changes to hair, and bleeding from the skin may also occur.

In 1753, researcher James Lind used three different diet approaches with men suffering from scurvy to determine that citrus fruits – higher in vitamin C- provided a solution to this condition.

In addition to vitamin C, vitamins A, D, E, B6, B12, and folate, along with minerals zinc, iron, copper, selenium, and magnesium also play vital, synergistic roles at every stage of the immune response.

Our immune defense system is composed of elaborate components, which provide physical and biochemical barriers, specialized immune cells, and antibodies that challenge and attack an invading pathogen.

The first line of defense is called the innate immune response – characterized by a challenge by the skin, hair, and mucus membranes to provide a barrier into the body. In other words, limit access points of entry.

From there, it's the job of biochemical attackers – leukocytes such as neutrophils, natural killer (NK) cells, and macrophages - to identify “non-self” molecules to open fire and destroy the invader, which is marked as an antigen. Cytokines (involved in cell signaling), then repair any damage.

That's followed by a second wave of attackers, T & B cells, which is the phase of the immune response characterized as adaptive immunity – that remembers the invader and coordinates a joint response.

The researchers from Oregon State and Bayer AG provide an excellent overview, “of the known mechanisms of micronutrients that are fundamental to immune function,” and how inadequate intake might affect risk to infection. Here are few of the impacts of specific immune modulating nutrients.

Vitamin A - important for intestinal immune response, thus supporting the gut barrier; carotenoids (either provitamin A or non-provitamin A) have immunoregulatory actions.

Vitamin D – calcitriol (a form of vitamin D3) regulates antimicrobial proteins responsible for modifying intestinal microbiota to a healthier composition and supporting the gut barrier, as well as, protecting the lungs against infection.

Vitamin C - promotes collagen synthesis and protects cell membranes from damage caused by free radicals, thus supporting integrity of epithelial barriers.

Vitamin E - protects cell membranes from damage caused by free radicals and support the integrity of epithelial barriers.

Vitamins B6, B12, Folate - involved in intestinal immune regulation (e.g., by mediating lymphocyte migration into the intestine) in the case of vitamin B6, while folate is essential for the survival of regulatory T cells in the small intestine. Human gut microbes use vitamin B12, as a cofactor for metabolic pathways, thus supporting the gut barrier. Folate is also important for sufficient antibody response to antigens.

Iron - essential for differentiation and growth of epithelial tissue.

Zinc - helps maintain integrity of skin and mucosal membrane (e.g., cofactor for metalloenzymes required for cell membrane repair); important in maintaining immune tolerance (i.e., the ability to recognize “self” from “non-self”).

Copper - role in functions of macrophages, neutrophils, and monocytes; enhances NK cell activity.

Selenium - helps to maintain antibody levels

Magnesium - cofactor of enzymes of nucleic acid metabolism and stabilizes structure of nucleic acids; involved in DNA replication and repair; roles in antigen binding to macrophages; regulates leukocyte activation; involved in the regulation of apoptosis (programed cell death).

Please keep in mind that each nutrient listed has additional immune support benefits, which are beyond the scope of this column. Nor are nutrient requirements listed, since that must depend on guidance from your physician.

What you can see, is the need to have a healthy eating plan and the support of a good multi-vitamin/mineral formula, as main components of your immune support plan – adding various forms of daily exercise to round out the mix.

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