Dynamic Chiropractic

NUTRITION / DETOXIFICATION

Nutrition and Immunity: An Evidence-Based Review (Pt. 3)

James P. Meschino, DC, MS

Editor's Note: Part 1 of this article appeared in the June issue and focused on vitamins C and D; part 2 ran in the July issue and discussed other key micronutrients, phytonutrients and probiotics.

Probiotics (Continued)

With respect to probiotics and upper respiratory tract infections, the Cochrane Review of 12 trials was included in a recent meta-analysis, and data from 3,720 participants in randomized, controlled studies conducted between 2002 and 2013, involving eight different countries, were analyzed. The researchers concluded:

"Probiotics were found to be more effective than placebo – reducing the number of participants who experienced episodes of acute URTI by about 47% and the duration of an episode by about 1.89 days. Probiotics also slightly reduced antibiotic use and cold-related school absences. In older adults, although probiotics did not reduce the rate of URTIs, the duration of the infection was decreased. Subgroup analysis of all age groups suggest that probiotics reduced the number of children experiencing acute URTIs. Overall, probiotics were found to be safe with few adverse effects (mostly gastrointestinal symptoms)."

These studies included a variety of different probiotic combinations, and thus, it is difficult to know what combination of live bacteria and yeast is the most ideal. In fact, no one knows, at this point in time, what the most ideal probiotic combination should be.

Promising Probiotics: With that said, various *Lactobacillus, Bifidus* and *Streptococcal* bacterial strains show impressive probiotic results, along with the yeast species *Saccharomyces cerevisiae*. I recommend taking a probiotic supplement each day containing a good mixture of these impressive probiotic species, in a form that delivers 2-10 billion living microorganisms per day.[26-29]

- Lactobacillus such as *L. acidophilus*, *L. rhamosus*, *L. rheuteri*, *L. plantarum*, *L. casei* and *L. salivarius*
- Bifidobacterium, such as *B. bifidum*, *B. animalis*, *B. breve* and *B. longum*
- *Streptococcus thermophilus*
- The yeast species – *Saccharomyces cerevisiae*

Melatonin

In addition to the supplement considerations mentioned above, melatonin also deserves some attention. Melatonin is a hormone made by the pineal gland in the brain, but some immune cells also synthesize it. As we age, melatonin secretion declines; this decline appears to be part of the reason our immune function also declines via the aging process – a condition known as immunosenescence.

Studies show that the T-lymphocyte known as the CD4 cell or the T-helper cell, which is the quarterback of the entire immune system, has melatonin receptors. With a decline in melatonin levels in aging, there is less CD4 cell modulation by melatonin, and the immune system becomes weaker and less efficient.

Experimental studies show that many immune parameters improve to more youthful function when

melatonin is administered to aging animals. The same is likely true in humans. In fact, many rheumatologists recognize that melatonin supplementation can increase the strength of the immune system in humans, and therefore caution their autoimmune patients about using melatonin supplements, as it may exacerbate their autoimmune condition, such as rheumatoid arthritis or lupus.

In addition, patients who have severe allergies or lymphoma, and transplant patients on immunosuppressant drugs, are often cautioned by their doctor about taking melatonin supplements because of its potential to heighten immune system activity.

However, for otherwise healthy adults over the age of 40 (when melatonin levels are substantially lower), it may be wise to consider low-dose melatonin supplementation one hour before bedtime, as an adjunctive strategy to support and strengthen immune function. Large human intervention trials using melatonin for this purpose are still lacking, but preclinical studies are very impressive, showing positive effects on reversing many aspects of the aging process on the immune system. Remember that as you get older, your body makes less and less melatonin and thus, higher and higher dosages may be required the older you become.

Here are some guidelines to consider if taking melatonin is something you wish to pursue or recommend to patients:

- *Age 40-50*: 500 mcg – 1 mg, taken one hour before bedtime
- *Age 50-65*: 1-2 mg, taken one hour before bedtime
- *After Age 65:* 1-3 mg, taken one hour before bedtime

Note that if you wake groggy the next day, the melatonin dosage you are taking is likely too high. So, start with a lower dosage and gradually increase it to find which dosage helps you get a good night's sleep without zapping your energy the next day.[30-33]

Sugar, Alcohol & Immune Suppression

Two final notes regarding nutrition and immunity relate to sugar intake, high blood sugar and alcohol ingestion. Studies suggest consumption of too much refined sugar can suppress immune function for many hours after its ingestion. This is one of the reasons diabetics are immune-compromised.

Higher blood sugar levels inhibit the ability of immune cells to secrete antimicrobial agents such as beta-defensins, which many immune cells use to burst a hole through the outer membrane of viruses trying to invade the respiratory tract and other body surfaces. Thus, individuals should strive to keep their blood sugar in the ideal range, enabling immune cells to generate this important antiviral, antibacterial, antifungal agent, and maintain their ability to trap and devour various threatening microbes.[34-36]

Alcohol consumption has also been shown to suppress immune system function. In fact, some studies show an all-or-none effect on the immune system, meaning any level of alcohol consumption (even moderate drinking) suppresses immune function in humans.

With that in mind, another way to help patients maintain more optimal immune function is to caution them about alcohol consumption. With respect to respiratory tract infections, studies have shown that alcohol consumption impairs key immune cells (macrophages and neutrophils) in the respiratory tract, including the lungs, and damages epithelial cells that line the lung surface.

Other studies show that those who consume alcohol at higher-than-moderate levels experience double the rate of pneumonia, and have increased rates of tuberculosis, hepatitis C and cancer; as well as greater exposure to hepatitis B, HIV and other infections. Alcohol has also been shown to inhibit the ability of neutrophils to migrate to sites of infection.[37-40]

A Special Note for Athletes: L-Glutamine as an Immune Booster

L-glutamine is an amino acid which is a primary fuel for many immune cells, as well as cells that line the intestinal tract. Studies suggest L-glutamine supplementation reduces the frequency of upper respiratory tract infections in athletes who engage in and train for competitive endurance athletic events. As such, for certain individuals, supplementation with L-glutamine (1,000-5,000 mg per day) may be a consideration in helping to support immune function.[41]

Clinical Takeaway

For most healthy adults, to support immune function it may be wise to take a high-potency multivitamin-mineral enriched with antioxidants (i.e., vitamin C 1,000 mg, vitamin E 200-400 IU, beta-carotene 15,000 IU, selenium 200 mcg). If vitamin D levels are below 80 nmol/L (32 ng/ml) then it may be wise to take higher amounts of vitamin D to achieve a more ideal blood level.

Additionally, taking a supplement containing astragalus, reishi mushroom extract, milk thistle and indole-3-carbinol may be another consideration. Some individuals go further and ingest a teaspoon per day of a 14-mushroom-blend powder containing a mix of potent medicinal mushrooms.

Consumption of probiotics is also a strong consideration, as is melatonin for those over 40-45 years of age. For certain individuals (especially high-performance endurance athletes), L-glutamine supplementation may also be helpful to optimize immunity.

Last, but not least, it is important to get adequate sleep, avoid overtraining, keep blood sugar in the ideal range and avoid or use alcohol judiciously.

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