Doctors' Choice
NUTRITION

The Immune System & Chronic Illness: by Dr. Aaron Hoo, B.Sc., N.D.

In my daily clinical practice, I often see patients who are diagnosed with chronic illnesses. While some of these individuals are understandably burdened by their condition, a majority of them maintain an extraordinary positive attitude. I asked a patient of mine how she dealt with her challenge everyday, and she replied simply, "it's a state of mind". Her statement was both inspiring and humbling at the same time, reminding me of the strength of the human spirit.

Indeed, the mind is an essential component in the maintenance of wellness, and together with a healthy body and spirit, I do believe it leads us to the road toward wholeness. However, the mind, body and spirit are intimately linked in the pursuit of wellness; one component cannot survive without the other. Without diminishing the role of the mind or spirit, this month article focuses on the body; specifically the role of the immune system in the development of chronic debilitating illness.

For the immune system to work properly, two things must happen: first, the body must recognize that it is being threatened by foreign microorganisms. Second, the immune response must be activated quickly before many body tissue cells are destroyed by the invaders.

In our environment, we are constantly exposed to viruses (such as those that cause colds and influenza), bacteria (such as those that cause pneumonia and food poisoning), parasites, and fungi. In a healthy individual, the immune system is efficient in the removal of these harmful organisms. However, when the immune system is overworked or weak due to chronic stress, poor nutrition or exposed to chemical/environmental toxicities (ie. smoke, herbicides, pesticides), it is less effective at removing toxic & mutated cells, or harmful pathogens. The resulting consequences can be severe, leading to the development of chronic illnesses that can be debilitating.

Chronic illnesses can result from a hypo-functioning of the immune system or a hyper-functioning of the immune system. In other words, while the human body is always attempting to maintain a level of homeostasis, an imbalance can result in either of two types of immune disorders: immunodeficiency diseases occur as a result of a weakened immune function (ie. HIV), while autoimmune conditions occur when the cells of the body's own immune system attacks healthy cells (ie. rheumatoid arthritis or systemic lupus erythematosus).

In order to appreciate the role of the immune system in the development of chronic illness, we must first understand the basic fundamentals of this system. The immune system is comprised of various organs, cells and chemical messengers that seek out and destroy invading micro-organisms.

This system provides the human body with protection against various micro-organisms that cause disease. In general, the immune system can be viewed as a network that protects us from pathogens that are determined to be invaders. More specifically, the body's immune system is able to discriminate between beneficial "non-self" invaders (food or helpful bacteria) versus threatening invaders.

In order to prevent the onset of an acute illness or the development of chronic conditions, we can be more disease resistant by making healthier dietary choices, changing certain lifestyle habits, and using various natural health products to boost and maintain a healthy immune function.

For example, adopting simple lifestyle modifications such as drinking 1.5 litres of water and eating 4-5 small meals per day, maintaining a healthy weight, ensuring adequate sleep and making time to rest during the day, as well as regular exercise at least 3-4 times per week are all beneficial for the immune system.

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I advise my patients that optimal functioning of the immune system is associated with increasing dietary intake of colourful organic fruits and vegetables (for a healthy dose of B-carotene and Vitamin C) which provide a source of anti-oxidants; eating low-fat meals to avoid the production of inflammatory mediators (these are especially high in red meat) which can exacerbate inflammatory conditions like arthritis and fibromyalgia; increasing the consumption of dietary fibre (ie. bran muffins, green leafy vegetables) which promotes regular bowel movements for the removal of waste products as well as decrease the risk of colon cancer. In addition, adequate intake of dietary protein (from soy, beans, legumes, game and fish) which make up all the cells of our body, but specifically, T-cells and B-cells which are lymphocytes that are responsible for the specific immune response (T-lymphocytes are made in the thymus gland, while B- lymphocytes are made in bone marrow).

B- and T-lymphocytes are individually configured to attack a specific antigen. For example, the blood and lymph of humans have T-cell lymphocytes that specifically target the chicken pox virus, the diphtheria virus, and so on. When T-cell lymphocytes specific for the chicken pox virus encounter a cell infected with this virus, the T-cell multiplies rapidly and destroys the invading virus.

After the invader has been neutralized, some T-cells remain behind. These cells, called memory cells, impart immunity to future attacks by the virus. For example, once a person has had chicken pox, memory cells quickly prevent subsequent infections.

In contrast to T-cells, a B-cell specific for the invading antigen is stimulated to divide and produce antibodies. The dividing B-cells secrete antibodies composed of a special type of protein called immunoglobin (Ig). There are different types of immunoglobulins (ie. IgA, IgE, IgG, IgM) that are present in different parts of the body. For example, secretory IgA is the first line of defence in the mucous secretions of the digestive system, mouth, lungs, urinary tract and other body cavities.

Enhancing the immune system also requires supplementation with various natural health products (including vitamins) which are essential. Antioxidants such as Vitamins A, C, E, and Zinc as well as Selenium are some basic supplements which should be in everyone's medicine cabinet. For example, studies show that a deficiency of Vitamin A appears to damage some key elements of the immune system, namely neutrophils (a type of white blood cell), macrophages (cells which engulf bacteria and foreign bodies) and natural killer cells (a type of white blood cell that is the body's first line of defence against viruses and cancer cells).
Vitamin E and Vitamin C are potent antioxidants that protect the body against oxidative stress and free radicals which damages healthy cells. Of note, free radicals are implicated in cancer, atherosclerosis, hypertension, arthritis, and Alzheimer's disease.

Zinc deficiency is common in the elderly and in those suffering from impaired immunity. People who are deficient in zinc are prone to getting more frequent and longer lasting infections of various types. Zinc acts as an immune booster, in part due to stimulation of the thymus gland. This gland tends to shrink with age, and consequently produces less of the hormones that boost the production of infection-fighting white blood cells. Zinc acts as a co-factor for the antioxidant SOD (super oxide dismutase), as well as provide protection against heavy metal toxicity, such as cadmium and lead, as well as copper toxicity as in Wilsons Disease (in the Winter 2002 issue of this magazine, I discussed the role of detoxification, and heavy metal toxicity in its association with chronic illness).

Studies have associated certain types of viruses with chronic conditions (ie. Epstein-Barr virus and Chronic Fatigue Syndrome) or certain types of cancer. As such, I recommend Selenium which, aside from being an antioxidant, it is (in naturopathic circles), termed as "nature's viral birth control pill". Selenium stimulates antibody production, as well as that of lymphocytes, macrophages and natural killer cells. Selenium is involved in the synthesis of the enzyme glutathione peroxidase which is responsible for detoxification in the body.

Aside from nutritional supplements, various botanical/herbal medicines have been shown to be highly effective in supporting the immune system. Herbal medicine dates back for centuries and is indeed, the basis for research into many pharmaceutical agents (ie. In 1828, European chemists extracted the constituent salicin from white willow bark and converted it to salacylic acid. At the end of the nineteenth century, acetylsalicylic acid was synthetically produced. The end result is – aspirin).

Examples of herbal medicines which support the immune system include: garlic (*Allium sativa*), astragalus (*Astragalus radix*), cat's claw (*Uncaria tomentosa*), and panax ginseng (*Eleutherococcus senticosus*).
Garlic enhances the immune system by increasing natural killer cell and phagocytic activity of white blood cells. Astragalus stimulates the immune system by activating the human macrophage/monocyte cell lines (cells which engulf bacteria and foreign bodies); cat's claw however, appears to combat free radicals as well as increase lymphocyte counts.
Panax ginseng seems to improve cellular-mediated immunity. Cellular immunity is involved when the specific immune response is activated. Two types of specific defenses destroy microorganisms in the human body: the

cellular-mediated response (this produces T-cells) and the humoral-mediated response (these results in the production of antibodies).

Although I write about these herbs here, I strongly advise against self-prescribing to avoid potential drug interactions. Rather, I recommend readers consult a licensed herbalist or naturopathic doctor before taking herbal medicines.

While I have included some key vitamins, minerals and herbal medicines in the artillery against illness, they are by no means an exhaustive list. If you currently enjoy great health, thank your immune system and consider yourself blessed. However, whether one is healthy or challenged, the immune system is not something to ignored or taken for granted.
Remember that in order to fortify your immune system and resist dis-ease, it is essential to adopt a balanced and nutritious diet, drink plenty of clean bottled water, maintain a positive attitude, get plenty of rest and exercise complemented with vitamins, high quality dietary supplements and some herbal medicines.

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