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# Nutraceuticals play prime role in boosting immunity

*Dr Sanjay Agrawal*, **Wednesday, May 18, 2016, 08:00 Hrs [IST]**

Living well and maintaining a healthy immune system in human life can sometimes be challenging. The immune system is the body's defense against infectious organisms and other invaders. The immune system is a network of cells, tissues, and organs that work together to protect the body from infection. The human body provides an ideal environment for many microbes, such as viruses, bacteria, fungi, and parasites, and the immune system prevents and limits their entry and growth to maintain optimal health. Through a series of steps called the immune response, the immune system attacks organisms and substances that invade human body systems and cause disease. One of the important cells involved in human body are white blood cells (WBC), also called leukocytes, which come in two basic types that combine to seek out and destroy disease-causing organisms or substances. The two basic types of leukocytes are: phagocytes, cells that chew up invading organisms and lymphocytes, cells that allow the body to remember and recognize previous invaders and help the body destroy them. These cells not only protect human body but also simultaneously they create memory of previous attack by germ cell or organism which is very essential for body so when again attack happened from same organism, body defense would generate antibody/protection in better manner than what it does before.

Human body immune system gets weakened through various reasons. The first is that immune response does not tend to be as effective during the colder months of fall and winter compared to warmer months. Secondly, chronic stress can cause almost all measures of immune system function to drop across the board. The third reason is that poor diet can compromise immune response. There are plenty of disorders especially skin conditions like eczema and psoriasis very common in Indian population. Dermatologists use mainly corticosteroids for treatment of these disorders which drug is responsible for reducing immunity level and above mentioned key protected cells. Certain other disorders and conditions like cancer, acquired immunodeficiency syndrome and alcoholism also precipitates immune deficiency states. So in a way certain health conditions and treatment both are responsible for getting immunity down.

Nutraceuticals play a very important role in boosting immunity without harming body's natural defense mechanism. Examples of important nutraceuticals such as vitamin C, zinc, selenium, beta 1,3/1,6 glucan and echinacea, they boost the immunity of human body system.

Vitamin C: Consider that vitamin C has been shown to affect various components of the human immune response, including antimicrobial activities, and lymphocyte proliferation. For the most part, the studies involved healthy, free living populations who supplemented with 200 mg–6g a day of vitamin C in addition to dietary vitamin intake. Hence, the results relate largely to the pharmacological range of vitamin C intakes rather than the nutritional range of intakes usually provided from food alone. It should also be noted that immune competent cells accumulate vitamin C, with a close relationship between the vitamin and immune cell activity, especially phagocytosis activity and T-cell function. Accordingly, one of the consequences of vitamin C deficiency is impaired resistance to various pathogens, while an enhanced supply increases antibody activity and infection resistance. In one randomized, controlled 5-year trial, those who took 500 mg/day of supplemental vitamin C had a 66 per cent lower risk of contracting three or more colds in a five-year period compared to those who took 50 mg/day of supplemental vitamin C. In another study, 500 mg/day of vitamin C increased the SOD and catalase activities (powerful antioxidants) of immune cells known as lymphocytes.

**Zinc**
Zinc, a bluish-white lustrous metallic element, is essential for the integrity of the immune system, and inadequate zinc intake has many adverse effects. The immunologic mechanisms whereby zinc modulates increased susceptibility to infection have been studied for several decades. It is clear that zinc affects multiple aspects of the immune system, from the barrier of the skin to gene regulation within lymphocytes. Zinc is crucial for normal development and function of cells mediating nonspecific immunity such as neutrophils and natural killer cells. Zinc deficiency also affects development of adaptive immunity. Furthermore, in both young adults and elderly subjects, zinc supplementation decreased oxidative stress markers and generation of inflammatory cytokines.

**Selenium**
Selenium, a toxic nonmetallic element related to sulphur and tellurium; occurs in many allotropic forms, is incorporated into a number of selenium-dependent antioxidant enzymes, also known as selenoproteins. These selenoproteins include glutathione peroxidases, which offer antioxidant protection against free radicals and other damaging reactive oxygen species. As such, there is much potential for selenium to influence the immune system. For example, the antioxidant glutathione peroxidases are likely to protect neutrophils from oxygen-derived radicals that are produced to kill ingested foreign organisms. Of particular interest is a 12-week human intervention study in which 119 volunteers took either a selenium supplement or a placebo daily to examine the response to an influenza vaccine. The results were that there was a heightened immune response in the selenium group (compared to placebo), further supporting the relationship between selenium status and immune function.

**Beta 1,3/1,6 glucan**
A yeast beta 1,3/1,6 glucan derived from the cell wall of a proprietary strain of Saccharomyces cerevisiae has been well researched, and its mechanism of action for this beta 1,3/1,6 glucan well documented. Once swallowed, immune cells in the gastrointestinal tract take up beta 1,3/1,6 glucan and transport it to immune organs throughout the body. While in the immune organs, immune cells called macrophages digest beta 1,3/1,6 glucan into smaller fragments and slowly release them over a number of days. The fragments bind to neutrophils, which are the most abundant immune cells in the body. Beta 1,3/1,6 glucan primes and strengthens the key immune function of neutrophils that now move more quickly throughout the body. It is important to note that beta 1,3/1,6 glucan boosts immune function without over stimulating the immune system. Also, multiple human clinical studies have shown that this beta 1,3/1,6 glucan is effective in the treatment of upper respiratory tract infections (URTI) such as the common cold.

**Echinacea**
Echinacea, a small genus of north American coarse perennial herbs, is the granddaddy of all immune enhancing herbs. It is excellent in helping to prevent and treat colds and influenza. Research reveals that echinacea supports the immune system by activating white blood cells (lymphocytes and macrophages). Echinacea also increases the production of interferon, an immune component that is important in responding to viral infections.

This way nutraceuticals play a prime role in boosting immune response and help human body staying healthy.

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