

immune response, and partially restored immune function of cells in test tubes. Astragalus has also been found to stimulate the production of interferon (a group of substances produced by the body as part of the normal defense mechanism against viral infections) and reduce the length of colds.¹

Echinacea

As one of the most popular and widely used herbs in the United States, the use of Echinacea has become quite prevalent in preventative care. Archaeological evidence indicates that Native Americans used this herb for over 400 years to treat infections and wounds. The popular use of the herb began to decline during the 18th and 19th centuries with the introduction of antibiotics. It is well known that antibiotics cannot be used to treat viral infections and consequently, as preparations of Echinacea became increasingly popular in Germany during the 20th century, the trend also made its comeback in the U.S.

Testimonial

Most studies found that echinacea (when taken at the first sign of a cold for 8 to 10 days) reduced cold symptoms or shortened their duration. For example, in a study of 95 people with early symptoms of cold and flu (such as runny nose, scratchy throat, and fever), those who drank 5 to 6

rhinovirus and respiratory syncytial virus (both of which cause symptoms of the common cold).⁴

Evidence

The rhinoviruses and the coronaviruses are the most common causes of a cold. According to the National Institute of Allergy and Infectious Diseases (NIAID), the rhinoviruses cause about one-third of all colds (30 to 35 percent), while the most common causes of adult colds are the coronaviruses. There are more than 110 different rhinoviruses that cause most colds in early fall, spring, and summer. Named after the Greek word "rhin" for "nose," rhinoviruses thrive in the human nasal mucosa.⁵

A liquid extract from *Eleutherococcus senticosus* roots inhibited the productive replication of human rhinovirus (HRV), respiratory syncytial virus (RSV) and influenza A virus in cell cultures infected with these viruses, all of which belong to the RNA type viruses. Analysis of virus production after treatment of the infected cells using plaque-reduction assays showed a strong antiviral activity of the *Eleutherococcus* extract. In contrast, no effect was

detected using the same protocol for cells infected with the DNA viruses, adenovirus (Adeno 5) or herpes simplex type 1 virus (HSV 1). Pre-treatment of cells did not inhibit either virus adsorption or virus replication. The results of the study demonstrate that the *Eleutherococcus* extract inhibited the replication of all RNA viruses studied so far. This antiviral activity remained stable under the conditions used for drug preparation and storage.⁶

Goldenseal

Goldenseal root is popular herb that has been widely used since the 1990's. It became so popular and over harvested that in 1997, the Convention on International Trade in Endangered Species of Wild Fauna and Flora reported its risk of becoming an endangered species. Consequently, international trade of the herb is strictly regulated.

Testimonial

Many professional herbalists recommend goldenseal in herbal remedies for hay fever (also called allergic rhinitis), colds, and flu. Laboratory studies suggest that this substance has antibacterial and immune-enhancing properties and may also have cardiovascular benefits. Berberine has been shown to dilate blood vessels. It may also activate white blood cells, making them more effective at fighting infection.⁷

Allopathic drugs have been shown to have little or no effect upon viruses, but natural therapeutics have proven to serve as the first and best line of defense.

Evidence

Scientists investigated the antigen-specific in vivo immunomodulatory potential of continuous treatment with Echinacea and Goldenseal root extract over a period of 6 weeks using rats that were injected with the novel antigen keyhole limpet hemocyanin (KLH) and re-exposed to KLH after the initial exposure. Immunoglobulin production was monitored via ELISA continuously over a period of 6 weeks. The Echinacea-treated group showed a significant augmentation of their primary and secondary IgG response to the antigen, whereas the Goldenseal-treated group showed an increase in the primary IgM response during the first 2 weeks of treatment. Results suggest that medicinal plants like Echinacea or Goldenseal may enhance immune function by increasing antigen-specific immunoglobulin production.⁸

Quercetin

Quercetin may be useful as a drug in reducing the oxidative stress induced by influenza virus infection in the lung, and protect it from the toxic effects of the free radicals.⁹

Evidence

Influenza virus infection, induced experimentally in mice, was associated with marked changes in lung morphology viz. epithelial damage with focal areas of reactive papillary hyperplasia, infiltration of leukocytes and development of oxidative stress, as evidenced by increased superoxide radical production and lipid peroxidation (LPO) products by alveolar macrophages. These effects were observed on the 5th day after virus instillation. The levels of superoxide and LPO were measured spectrophotometrically by the nitroblue tetrazolium (NBT) assay and thiobarbituric acid reactive species (TBARS) assay, respectively. The former increased by 1.5-2 fold and the latter was raised by 85% when compared with normal control. Supplementation of intranasal viral instillation with the antioxidant, Quercetin, given orally, resulted in a significant decrease in the levels of both superoxide radicals and LPO products. There was also a significant decrease in the number of infiltrating cells. A mild to moderate protective effect was observed in lung morphology. Thus, Quercetin may be useful in reducing the oxidative stress induced by influenza virus infection in the lung, and protect it from the toxic effects of the free radicals.¹⁰

Vitamin C

Although most animals can manufacture this vitamin, the human cannot. The primary function of vitamin C is to manufacture collagen, the primary protein substance of the human body. Specifically, vitamin C aids the formation of hydroxyproline. In addition to its role in collagen metabolism, vitamin C is also critical to immune function, to the manufacture of certain nerve transmitting substances and hormones, to carnitine synthesis, to the absorption and utilization of other nutritional factors, and it is even one of the most important nutritional antioxidants.

Evidence

One hundred sixty-eight volunteers were randomized to receive a placebo or a vitamin C supplement, two tablets daily, over a 60-day period between November and

Did you know?

- Individuals are more susceptible to developing weakened immune systems because our world is filled with such high levels of chronic stress, pollution, radiation, and toxins.
- A healthy diet and optimal nutrient acquisition are vital for a strong immune system.
- Enhanced circulation and removal of toxic waste will promote the delivery of strong immune cells to fight infection.
- A balanced gut flora enforces digestion and immunity.

February. They used a five-point scale to assess their health and recorded any common cold infections and symptoms in a daily diary. Compared with the placebo group, the active-treatment group had significantly fewer colds (37 vs 50, P<.05), fewer days challenged virally (85 vs 178), and a significantly shorter duration of severe symptoms (1.8 vs 3.1 days, P<.03). Consequently, volunteers in the active group were less likely to get a cold and recovered faster if infected. Few side effects occurred with the active treatment, and volunteers reported greatly increased satisfaction with the study supplement compared with any previous form of vitamin C. This well-tolerated vitamin C supplement may prevent the common cold and shorten the duration of symptoms. Volunteers were generally impressed by the protection afforded them during the winter months and the general acceptability of the study medication.¹¹

Vitamin A

Scientists examined the effect of advanced vitamin A deficiency (serum retinol < or = 0.35 micromol/L, with weight gain significantly lower than in controls with free access to food) on the secretory immunoglobulin A (IgA) response to a mild, upper respiratory tract infection with influenza A virus in BALB/c mice. Mice fed a vitamin A-deficient or control diet were infected intranasally at 11 to 12 wk of age. The influenza-specific salivary IgA response was lower in the vitamin A-deficient mice (0.11 +/- 0.13% of total IgA 4 wk after infection) than in controls with free access to food (2.73 +/- 1.86%, P < 0.0001). In a separate experiment, the response of vitamin A-deficient mice (0.42 +/- 1.51%) was also lower than that of pair-fed controls (3.43 +/- 4.76%, P < 0.0001). In addition, fewer influenza A-specific IgA-secreting plasma cells were found in the salivary glands of vitamin A-deficient mice (geometric mean 3.0%) than in controls with free access to food or in pair-fed controls (geometric mean 8.7%, P < 0.0001). Although the pathogen-specific IgA response was decreased, vitamin A-deficient mice had a significantly higher concentration of total salivary IgA (31.9 +/- 15.9 mg/L) than did the pair-fed controls (14.3 +/- 8.4 mg/L, P < 0.0001). Northern blot analysis of salivary gland RNA revealed that these vitamin A-deficient mice also had greater levels of mRNA of the polymeric immunoglobulin receptor (pIgR), which transports IgA across mucosal surfaces (pIgR: beta-actin mRNA ratio = 7.8 +/- 0.8), than did pair-fed control mice (3.7 +/- 0.4, P = 0.0001). These data demonstrate that vitamin A

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deficiency has contrasting effects on the secretory IgA response to influenza infection, with a principal effect being a decrease in the pathogen-specific response.¹²

Glandular Therapy

Glandular therapy in this case refers to tissue extracts of the bone marrow and thymus, which are used to promote and enhance the effect of corresponding human tissue by mimicking its function. Ingestion of glands such as the thymus are known to have endocrine functions, which can secrete hormones directly into the blood stream and provide the body with biologically active substances that would normally be secreted by the gland. In the body, it is the site of maturation for T-cells, which are involved in regulating secretions of interleukin-1, interleukin-2, and interferon. Similarly, raw bone marrow, in the body, is known as a myeloid tissue that produces new white blood cells, platelets, B cells, killer cells, granulocytes, and thymocytes.

Testimonials

Raw thymus extract, in particular, has been used successfully to boost immune strength in those with weakened systems. "You want all the possible rejuvenation of the thymus gland that you can get," says Dr. Michael Rosenbaum, "because the thymus gland is the major controlling gland of the immune system. It is the teacher gland that instructs the immune cells how to select and destroy foreign invaders."¹³

Proteases

Proteolytic enzymes with immunomodulatory benefits promote normal blood flow and help hydrolyze oxidized proteins. They are typically used as a digestive aid for optimal hydrolysis of food proteins to reduce food intolerances and allergies. Additionally, when taken between meals they impart numerous systemic benefits. Proteolytic enzymes have fibrinolytic activity which reduces inflammation and may help attenuate and/or prevent tumor cell growth. With respect to their modulation of the immune system, they exhibit an increased binding of several very important cytokines such as TGF- β and TNF- α , which is a necessary step in host defense against tumor cell. The use of proteolytic enzymes increased the tumoricidal and cytotoxic activities of polymorphonuclear neutrophils. Furthermore, there are some studies that indicate that proteolytic enzymes selectively remove some adhesion molecules such as CD4, CD44, B7-1, ICAM-1, B7-2, CD45RA, CD6, CD7, E2/MIC2, and Leu81/LAM 1 from cell surfaces. According to Hale et al., the removal of these surface molecules remarkably enhances CD2 mediated T-cell activity.

Evidence

Researchers investigated the use of hydrolytic enzymes to treat diseases associated with immune complexes. In

order to determine the impact of oral enzymes on a disease, they induced arthritis in rabbits previously immunized against ovalbumin by injecting them intrarticularly with ovalbumin in the knee joints. The animals that received oral hydrolytic enzymes did not have arthritis, whereas the control animals that were not given oral enzymes had marked arthritic symptoms.¹⁴

Other researchers investigated the role of proteolytic enzymes in modulating the complement binding capacity to the antibody/antigen complex. This particular study focused on the modulation of complement binding to fixed immune complexes. The hypothesis is that if the enzymes can modulate complement C1q binding, that would reduce or alleviate several inflammatory diseases. In fact, their studies indicated that the proteolytic enzymes used lessen the C1q binding capacity of fixed immune complexes. Furthermore, their study showed that alpha 2 macroglobulin did not inhibit the protease trypsin used, whereas aprotinin did inhibit the proteolytic activity and thus prevented the modulation of the C1q binding ability.¹⁵

Final Thoughts

The immune system is our most powerful weapon against disease. In people with compromised immune systems, influenza can cause serious complications. Natural therapeutics and enzyme supplementation has been proven to serve as the first and best line of defense against invading microorganisms. This formulation will offer the vital support that the immune system needs to remain healthy and to remain fully capable of providing our body with the protection that it needs. The supportive and restorative properties of these powerful natural ingredients offer stimulation and support of the body's immune function, helping the body's defense system regain and maintain its natural strength and vitality.

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with evidence-based nutrition

Consider the following review of Clinical Research results and practical testimonials on several important active ingredients in ImmunZyme.

Good nutrition is a fundamental player in promoting health and preventing illness. The philosophy of Transformation Enzyme Corporation advocates and encourages (1) healthy diet and lifestyle choices, (2) the promotion of optimal digestion and immune regulation, and (3) the maintenance of proper elimination and a well-balanced gut flora. Nutrient absorption and acquisition are imperative in regulating the metabolic processes involved, as well maintaining a strong immune system. During times of increased stress, whether external or internal, there are substantiated herbs, vitamins, and minerals that can further strengthen and reinforce our body's defense system naturally. *ImmunZyme* is an excellent formulation to provide that additional support during this flu season.

Astragalus

Astragalus (*Astragalus membranaceus*) is most commonly used as a general tonic for those practicing Chinese herbal medicine, and specifically for immune enhancement. Most research on astragalus has focused on its immunostimulatory activity and its seemingly remarkable ability to restore the activity of a suppressed immune system. Clinical trials as well as pharmacological data provide evidence for its usefulness in the prevention of the common cold and as an adjunct to cancer therapies.

Testimonial

A number of clinical studies have been reported regarding the use of astragalus for colds and upper respiratory infections. A prophylactic effect against the common cold was reported in an epidemiological study in China involving 1,000 subjects.

Evidence

Administration of astragalus, given either orally or as a nasal spray, decreased the incidence of illness and shortened the length of its course. Studies exploring this protective effect found that a two-week oral administration of the preparation enhanced subjects induction of interferon by peripheral white blood cells. Levels of IgA and IgG (immunoglobulin) antibodies in nasal secretions increased following two months of treatment.

The effect of astragalus on the induction of interferon was studied in another placebo-controlled study involving 28 people. Fourteen volunteers were given an extract equivalent to 8 g dried root per day and 14 were given placebos. Blood samples were drawn before treatment, then two weeks and two months after treatment. Interferon production by leukocytes was statistically increased after both time periods.

Researchers at the University of Texas MD Anderson Cancer Center found that the astragalus extract enhanced the cell-destroying ability (cytotoxicity) of a conventional immunotherapy treatment (interleukin-2) by improving the

Vitamin A	1750 IU
Vitamin C	125 mg
Zinc	2 mg
Astragalus	50 mg
Echinacea	20 mg
Thymus Substance	20 mg
Red Clover	20 mg
Goldenseal Root	20 mg
Raw Bone Marrow	20 mg
Quercetin	20 mg
Siberian Ginseng	10 mg
beta-Carotene	1000 IU
Enzyme Delivery System	40 mg