

Perilous Pathways: Environmental Chemicals and Environmental Illness, A Major Role for Vitamin A

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Exposure to any of a wide range of environmental chemicals (ECs) causes environmental illness (EI) in both humans and wildlife. ECs include pesticides such as insecticides and herbicides and non-pesticides such as PCBs and dioxin. EIs include fibromyalgia, chronic fatigue syndrome, multiple chemical sensitivity, and Gulf War Syndrome. All of these diseases appear to be autoimmune in nature. Other common autoimmune diseases include rheumatoid arthritis, insulin-dependent diabetes, systemic lupus and multiple sclerosis.

Frequencies of occurrence of autoimmune diseases have increased dramatically in recent decades. Characteristically, these illnesses occur 5-10 times more commonly in women than in men. The reason for this is that the same process that regulates the immune system also regulates the reproductive cycles in women.

Vitamin A (retinol), and vitamin A hormone (retinoic acid), must be present in our bodies for normal functioning of the immune system and for the protein synthesis processes involved in reproduction. Lack of retinoic acid, the hormone form of vitamin A, characterizes most human autoimmune diseases. The question is whether these diseases are caused by lack of vitamin A or whether lack of vitamin A is caused by autoimmune disease? It turns out that lack of vitamin A is a precondition for the development of many if not all autoimmune diseases. This leads us to ask, what causes a lack of vitamin A?

There are three reasons for a lack of vitamin A in humans. One reason is genetic, a second is dietary, and the third involves exposure to ECs. Some people are born with unusually low levels of vitamin A. These individuals have a high sensitivity to sunlight. They need to wear sunglasses on sunny days and when they are driving. Autoimmune diseases appear to occur more often in such individuals than in those more tolerant of bright sunlight, mainly because of the lack of vitamin A. Their problem appears to be a lower-than-usual ability to make vitamin A from the retinyl ester precursors stored in body fat. Inadequate diet is certainly a major factor in vitamin A deficiency. Many third world populations lack access to animal products that supply vitamin A and vegetables that supply vitamin A precursors. The same may be true in the US as well for individuals eating similar poor diets.

The third reason, exposure to many ECs, is also associated with development of autoimmune illness. The reason seems to be that exposure to these chemicals poisons the process of making and transporting vitamin A and vitamin A hormone in our bodies. There are several processes that relate to chemically-caused deficiencies in vitamin A. Chlorinated phenyl chemicals such as dioxin and PCBs are known to poison the carrier protein transferrin which moves thyroid hormones and vitamin A from places where they are made to places where they are needed. It is probable that chlorinated herbicides such as 2,4-D do the same thing and exposures to chlorinated insecticides such as DDT, many synthetic pyrethroids and some organophosphates such as chlorpyrifos may also be involved.

Another way ECs reduce vitamin A is by poisoning our ability to make vitamin A. This occurs when we are exposed to pesticides that poison cholinesterase and other esterase enzymes. A major function of the other esterase enzymes is to activate vitamin A synthesis by hydrolyzing the retinyl ester precursors of the vitamin. When vitamin synthesis is low, there is less vitamin A hormone available to activate the immune system. The result is increased frequency of autoimmune diseases. Chemicals that poison the ability to make vitamin A are those pesticides that poison esterases. Organophosphate insecticides are most common as causal factors. Exposures to carbamate and pyrethroid insecticides may also be involved.

Individuals most at risk for autoimmune disease appear to be those individuals normally low in ability to make vitamin A who are also exposed to ECs. The combination is potentially very serious.

We can determine which ECs cause these problems. One way is to measure binding of ECs to transthyretin, the hormone carrier protein. A second is to measure concentration and distribution of vitamin A (retinol) and vitamin A hormone (retinoic acid) in animals treated with ECs. Elimination of ECs which flunk these tests should decrease rates of human EI.

Finally, while the measures outlined above may decrease the occurrence of EIs, they do not at this time offer ways to cure these health problems. However, understanding the cause is essential to developing effective therapies.

Editor's note

It is probably genetics that determines the optimal requirements for vitamin A of each individual, as well as the individual's ability to convert and store this essential nutrient. However, we believe that the phenomenon of low vitamin A status in infants is due to poor vitamin intake by the mother while pregnant. Remember that Weston Price found that the diets of healthy primitives contained at least ten times more vitamin A than the typical American diet.

Sidebars

How to Protect Yourself Against Environmental Contaminants

Avoid direct exposure as much as possible. Do not use pesticides in your home or on your garden. If pesticides are being sprayed nearby, stay inside. Avoid golf courses, which are heavily sprayed. Above all, do not use pesticide sprays on your skin and around your face. A recent study showed that DEET, a pesticide used by one-third of the population in the United States, caused neurons to die in regions of rat brains that control muscle movement, learning, memory and concentration.

Whenever possible, consume organic food, or food from farms where no spraying is done.

Take cod liver oil and eat other rich sources of vitamin A, such as liver, butter and egg yolks from naturally raised animals. As pesticides interfere with vitamin A pathways, extra reserves are needed for the body to function properly.

Eat cruciferous vegetables as much as possible. They contain a substance, called indole 3-carbinol (I3C), which helps block the production of toxic forms of estrogen and enhances the production of beneficial forms of estrogen. One-half cup of sauerkraut daily is an excellent idea.

Maximize your intake of protective minerals, especially calcium and magnesium. The best sources are raw milk products and bone broths.

Judy Hoy's experience with pesticide-poisoned animals (pages 12-24) indicates that the homeopathic cell salt Calc. Phos. 6X may offer protection, especially to the young.

Tincture of milk thistle is recommended by many for liver support and protection against pesticides.

Alternatives

Use herbal repellants for mosquitoes. Herbs that repel mosquitoes include cedar wood, garlic, lemongrass, frankincense, cinnamon, geranium, eucalyptus, basil, rosemary, cloves, peppermint, lemon balm, onions, feverfew, thyme and marigold.

Check for standing water (where mosquitoes can breed) around your house or garden. If you have a bird bath,

change the water in it daily.

Install a bat house in your back yard. Bats can consume hundreds of mosquitoes and other insects per hour.

An excellent spray for pests on roses and other delicate plants is tobacco juice. Let 1/2 cup tobacco flakes stand in 1 quart water for several hours. Strain and place in a hand-held sprayer.

Vinegar works wonders on weeds. Use a 10 percent concentration for young weeds, higher concentrations for older weeds. Try to coat all the leaves. This method even works on thistle and other tenacious plants. In one study, spraying of cornfields with 20 percent vinegar killed 80 to 100 percent of the weeds without harming the corn.

A great way to get rid of ants, and possibly other household insects, is to put out the artificial sweetener aspartame. Open a package of Equal or Nutrasweet and sprinkle it where the ants travel. It doesn't kill them directly but apparently it gets to the queen and the colony dies off. Just be careful that your children or household pets don't touch the aspartame!

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