INFECTION AND VACCINES IN AUTOIMMUNE DISEASES

Evaluating Environmental Triggers

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Although infection can trigger autoimmune disease, infection is more likely to protect us against autoimmune disease development.

Infectious Triggers

Autoimmune diseases (AD) develop in people with genetic susceptibility to certain autoimmune disorders when they're exposed to specific environmental triggers. Nearly 20 percent of the population has immune system genes that predispose them to autoimmune disease development. Yet, only a fraction of the people who are genetically predisposed go on to develop autoimmune disorders. And in some parts of the world autoimmune diseases are rarely seen.

Through a variety of mechanisms such as molecular mimicry, infectious agents can trigger autoimmune diseases. Paradoxically, however, infectious agents can also offer protection against autoimmune and allergic diseases. In an article in the September 2002 New England Journal of Medicine, the French researcher Jean-Francois Bach explains how a reduction in the incidence of infectious diseases caused by vaccines, antibiotics, and septic environments is directly responsible for the increased incidence of autoimmune disorders in industrialized countries.

While Bach supports these concepts with solid research studies and illuminating data, his theory is not new. In 1966, Leibowitz et al. showed how the incidence of multiple sclerosis (MS) is increased in families with high levels of sanitation, and in 1985 Strachan observed that the risk of allergic rhinitis was directly related to birth order and family size.

Steady Rise in Autoimmune Diseases

As Bach reports, epidemiologic data provide concrete evidence that in the last three decades there's been a steady rise in the incidence of allergic and autoimmune diseases in developed countries. In early June 2006, the national news reported an alarming increase in type 1 diabetes in children. And as I reported in a recent blog, the incidence of MS in children is not just rising but escalating at a furious rate. The incidence of Graves' disease in children is another matter of concern.

Although rarely seen in children a decade ago, Graves' is becoming a common childhood disorder. Scientists who profit from widespread vaccination programs (such as those recommending more than 30 vaccines before starting school) propose that more sensitive laboratory tests are causing people to be diagnosed with autoimmune diseases earlier. However, this isn't the case. Autoimmune diseases are still difficult to diagnose and
because they aren't usually suspected in children, diagnosis is usually part of an acute emergency work-up for a child presenting with crisis symptoms. Besides Graves' disease, MS, and diabetes, the incidence of Crohn's disease, atopic dermatitis, rhinitis and asthmas, has also risen in recent years, particularly in children.

**Incidence**

The incidence of allergic and autoimmune diseases isn't evenly distributed among geographic regions or ethnic groups. However, a decrease in incidence is seen from north to south in the Northern Hemisphere and from south to north in the Southern Hemisphere. This could be accounted for by the prevalence of adaptive immune system HLA genes seen in different populations, for instance the low incidence of immune system genes that provide susceptibility to diabetes in Japan and the high incidence of these genes in Sardinia.

However, the genetic influences are considered small compared to the environmental contributions including access to medical care, antibiotics and vaccinations. This is supported by the low incidence of systemic lupus erythematosus among western Africans compared to black Americans of the same ancestry.

**Daycare Decreases Risk**

Children attending daycare centers, who presumably have more infectious exposure, also have a lower incidence of autoimmune asthma than children in small families who do not attend daycare facilities. Children who use antibiotics during the first year of life are also reported to have a higher incidence of autoimmune asthma in later life. This is related to the change in immune system chemicals called cytokines caused by the use of antibiotics.

Children raised in rural areas who have more exposure to farm animals and cow's milk also have a lower incidence of autoimmune diseases. Children born by caesarean section or who have isolated living conditions have a higher incidence of type 1 diabetes, whereas children exposed to lactobacillus vaginal flora at birth have a lower incidence of autoimmune conditions, particularly atrophic dermatitis.

**Immune Function**

The immune system is designed to protect and defend us from infectious agents. When its functions are altered, the immune response is erratic. Over time, an erratic response cripples immune function. In its effort to protect us, the immune system cells react skittishly, targeting our body's proteins. Iatrogenic diseases are those caused by doctors or medical treatment. A perfect iatrogenic disease model can be seen in autoimmune diseases.

Anecdotal evidence also shows that exposure to infectious diseases is associated with decreased symptoms when immune-related diseases do occur. For instances, children
who have had measles have milder cases of nephritic syndrome and atopic dermatitis when they develop these diseases.

Resource: