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The Autoimmune/Cardiovascular Connection

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An increasingly common thread between nearly all health problems is inflammation. Rarely can one read about health without there being some mention of inflammation and its detrimental effects.

The literal meaning of inflammation is “to set alight, to ignite.” In this sense, we can view inflammation as a fire in the body, whether burning intensely in the case of a sprained ankle, or smoldering over a long period of time in the case of chronic conditions like asthma or autoimmune disease. Regardless, inflammation is the body’s attempt at self-protection and repair.

Inflammation is a diverse process. While necessary in the short term (fighting infection, healing wounds), long-term inflammation is almost wholly detrimental to the body and its organs. Systemic and or chronic inflammation wreaks havoc throughout the body, having multiple detrimental effects. And when this inflammation begins to attack the body itself—described as autoimmune disease—newer information tells us that the inflammation leads to even more disease in other areas of the body.

Researchers have been exploring the link between autoimmune conditions and heart disease. In fact, inflammation is the common link between atherosclerosis (also known as “hardening of the arteries”) and several autoimmune diseases including rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE).[1]

Inflammation is a well-established cause of atherosclerosis and other heart diseases.[2] Further, atherosclerosis, RA and SLE share commonly described autoimmune responses, with a greater occurrence of atherosclerosis in people with RA and SLE, leading researchers to believe that autoimmunity is involved in the atherosclerotic process.[3]

Understanding Autoimmune Disease

In autoimmune disease, a person's immune system mistakenly launches an inappropriate attack against tissues in the body. An autoimmune disease may be directed at a certain organ—such as the thyroid—or a particular tissue such as the synovium (smooth surface) in flexible joints.

In general, an autoimmune response leads to eventual damage in the targeted areas. Mainstream treatment focuses on using immunosuppressive medications (drugs that slow the immune system), though these treatments often come with separate side effects.

Some of the most common autoimmune diseases include:

- Rheumatoid arthritis. A chronic condition that primarily affects the joints of the hands and feet, although other joints can be involved. In RA, the smooth linings of the joints are attacked, leading to pain, swelling, joint deformity and bone damage. RA can cause fatigue and fevers as well, and is much more common in women than men.
- Lupus. Often called the "great imitator" because it creates a diverse collection of symptoms that are easily confused with other health conditions, lupus usually affects the joints, skin, blood cells, brain, kidneys, heart and lungs, and ranges from mild to very serious. Many people with lupus experience fatigue, rashes, painful joints and fevers. One of the most distinctive signs of lupus is a facial rash that resembles the wings of a butterfly unfolding across both cheeks. Lupus also affects women much more commonly than men.
  There are four main types of lupus:
  - *Systemic Lupus Erythematosus* (SLE) is the most common type and affects several areas of the body.
  - *Cutaneous Lupus Erythematosus* is mainly limited to the skin (cutaneous means "skin") and causes a variety of rashes and lesions. The most common type is known as discoid, as it leaves disk-shaped sores on the skin. Another common feature is the butterfly-shaped rash on the cheeks.
  - *Neonatal Lupus* is rare and occurs in babies born to women with lupus. It is caused by antibodies (proteins made by the immune system) from the mother affecting the baby in the womb. Affected babies are born with lupus symptoms that most often resolve after a few months. In some cases, neonatal lupus can cause lasting heart problems. Proper testing can lead to treatment of the baby before birth.
  - *Drug-Induced Lupus Erythematosus* is caused by certain medications such as

hydralazine (for blood pressure), procainamide (for irregular heart beats) and isoniazid (for tuberculosis). Lupus symptoms typically stop after the drug has been discontinued for several months.

- Sjögren's Syndrome (pronounced *shoh-grinz*). A systemic condition in which the immune system attacks the glands that produce tears and saliva, causing dry eyes and mouth. Other areas of the body may be affected as well causing skin, nose and vaginal dryness. It can also affect the kidneys, lungs, liver, pancreas, blood vessels and even the nervous system. Similar to other autoimmune conditions, women are disproportionately affected in the range of 10:1 to men.[4]
- Sarcoidosis. Involves collections of inflammatory cells known as granulomas that form in different organs. They occur most often in the lungs and lymph nodes, but can occur anywhere. Sarcoidosis occurs gradually and often improves or resolves spontaneously. Symptoms vary from none to chronic, and are the result of which particular organ(s) are affected. It usually occurs in people younger than 40, slightly favoring females.

Heart Health and Inflammation

In the cardiovascular system, inflammation is increasingly identified as a causative factor in heart disease, from its beginnings to end.[5] One theory of heart disease states that when oxidized (damaged) low-density lipoprotein (LDL, or the "bad" cholesterol) is taken up into the arterial lining, it then causes a chain reaction of immune (inflammatory) reactions that in the end cause the plaque to grow and eventually rupture, causing extensive damage in the cardiovascular system.[6]

Inflammation in the arteries occurs with more frequency in autoimmune diseases and several autoimmune diseases (RA, spondyloarthritis, SLE and vasculitis) are associated with early onset atherosclerosis.[7]

C-reactive protein (CRP) is a commonly used marker of inflammation in the body. It is raised in several different types of inflammatory conditions, including heart and autoimmune conditions. While not entirely diagnostic, CRP levels can be helpful in screening for inflammatory conditions.

Homocysteine is an amino acid normally present in the blood. It is a breakdown product from protein metabolism. Elevated levels of homocysteine are a risk factor for heart disease.[8] Additionally, other health factors that lead to elevated levels of homocysteine are also associated with autoimmune and other diseases.[9] Elevated homocysteine can be lowered using a combination of vitamin B6, B12 and folate with

your doctor's guidance.

Treating Autoimmunity and the Heart

Vitamin D has several roles in the body, including protecting against heart disease and autoimmunity. Deficiency of vitamin D is associated with many negative health conditions including autoimmune disorders and organ damage from excessive systemic inflammation (leading to atherosclerosis, kidney damage and high blood pressure).[10] Further, activated vitamin D receptors (found on the cells) can lead to anti-inflammatory effects in the body and can suppress autoimmune disease-associated inflammation.[11]

While the positive benefits of vitamin D cannot be argued, this also doesn't mean more is always better. Excessive dosing of vitamin D can in turn lead to hypercalcemia, a condition of excess calcium absorption and storage in the tissues. In turn, hypercalcemia is associated with sarcoidosis, one of the aforementioned autoimmune conditions.[12]

Other more general symptoms of vitamin D overdose include poor appetite, nausea, vomiting, weakness, frequent urination and kidney problems. One must take very large daily doses (50,000 IU) for months to become toxic. People with liver or kidney disorders or those who take thiazide diuretics may be more susceptible to vitamin D toxicity. Before one begins supplementing with vitamin D, a simple blood test can reveal levels and dosing can be based on this finding.

Avemar® is a commercially produced, specialized extract of fermented wheat germ. It may have immune system-modulating properties and has been shown to be of benefit in autoimmune conditions.[13] In laboratory animals with SLE, treatment with Avemar resulted in clinical resolution of symptoms.[14]

A strong association exists between cancer and autoimmune disease—several types of autoimmune conditions are reported with cancers, while malignant tumors are becoming more commonly diagnosed in autoimmune disease.[15]

These associations are difficult to explain; however, it isn't clearly understood whether this is due to the disease process itself or drug therapy. Many treatments for autoimmune conditions involve immune system suppression, thereby theoretically slowing the immune system making it harder to develop cancer. Additionally, the risk of developing cancer in the general population is roughly 35 percent, and this connection with autoimmune disease may be over reported. Regardless, there is a

definitive link, albeit poorly understood, between cancer and autoimmune conditions.

Knowledge and Prevention Are Key

There exists a strong link between autoimmune diseases such as rheumatoid arthritis, lupus, sarcoidosis and Sjögren's syndrome and cardiovascular disease. The common link is in all likelihood an inflammatory process, as both types of condition share similar immune system derangements.

Measuring and addressing proteins like C-reactive protein and homocysteine can help to identify and lower the risk of inflammation. Likewise, supplementing with vitamin D has an anti-inflammatory effect and Avemar may help lessen autoimmune disease severity.

Addressing the causes of autoimmunity is important, as there is an association between it and cancers.

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