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Lyme Disease - It's Cause, Symptoms and Treatment

An Interview With Prof. Garth Nicolson

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Given to www.ntfactor.com



Professor Garth Nicolson explains what causes Lyme disease, the symptoms to look out for, and his recommendations for the best ways to treat Lyme disease and the debilitating effects it can have on your life.

Professor Garth Nicolson of the Institute for Molecular Medicine in Huntington Beach, California is an invited speaker at the upcoming International Lyme and Associated Diseases Society Annual Conference in Jersey City, NJ on Oct. 14-17, 2010. The title of his presentation is "Reversing Mitochondrial Damage and Increasing Cellular Energy in Chronic Lyme and Lyme-Associated Infections."

Professor Nicolson, what causes Lyme disease?



Lyme Disease (LD) is caused by the bite of an infected tick and transmission of multiple infections from the tick to its host. Among these infections, the most well known is *Borrelia burgdorferi*, a spirochete bacteria that borrows into cells and can be found inside cells and tissues, and sometimes it can be found outside of cells in lymph and blood. In addition, another commonly found bacterial co-infections, such as *Mycoplasma fermentans* and sometimes *Mycoplasma pneumoniae* are found in LD. These small bacteria without a rigid cell wall also hide inside cells and tissues and are rarely found in body fluids. Another important intracellular

bacteria found as a co-infection in LD are various species of *Bartonella*. In addition, bacteria similar to *Mycoplasma*, *Ehrlichia* species, can be found in many LD patients as well as another bacteria, *Anaplasma* species. In addition to bacteria, Lyme ticks can also transmit *Babesia* species, a small protozoan. These infections are difficult to find and diagnose using current laboratory methods.

Thus LD is not a simple infection, and the possible presence of several pathogenic intracellular

microorganisms makes this disease especially difficult to diagnose and very difficult to treat. A further complication is the fact that Lyme-like diseases can involve one or more tick-borne infections without the presence *Borrelia burgdorferi*. This makes for a much more complicated picture than most patients and even physicians expect.

Transmission of LD may not always involve insects. It is very likely that LD infections can also be spread by transfusion of contaminated blood or blood products. In addition, some of the LD co-infections, such as *Mycoplasma*, are also airborne infections and can be spread by close contact with infected patients.

What are the signs and symptoms of Lyme disease?

Most people think that the first sign of tick-borne LD is a bull's-eye rash (*Erythema migrans*) at the site of the tick bite, but, in fact, that type of rash or any other characteristic rash does not occur in over one-half of Lyme patients. In addition, less than one-half of patients with the clinical symptoms of LD ever recall being bitten by a tick.

The signs and symptoms of LD are complex and can change over time. In the initial stages of LD the infection(s) is generally localized to the tissues surrounding the site of transmission causing swollen glands, skin sensitivities and fevers. However, the LD infection(s) can become disseminated and spread to various tissues and organs, often causing acute reactions, such as flu-like symptoms. At this stage or what has been called Early Lyme Disease the condition can usually be successfully treated with several weeks of antibiotics and other support.

Unfortunately, Early LD is often under-treated or not treated at all, and this can result in a disseminated, chronic infection(s) that cause many chronic signs and symptoms. In cases where the infection(s) have been present (even if treated) and disseminated for at least 6 months immune and endocrine dysfunction, low-grade fevers, chronic fatigue, persistent neurological symptoms, arthritic symptoms, among many other signs and symptoms, are characteristic of Chronic LD. In Chronic LD virtually any organ or tissue can be affected, and patients with Chronic LD usually have many clinical problems and multiple signs and symptoms.

What is the treatment for Lyme disease?

There is no single treatment that is effective in suppressing LD. Although Early LD can be treated with antibiotics, the types of antibiotics necessary to successfully treat LD depends on the types of LD co-infections present. Unfortunately, when LD progresses to Chronic LD, it is extremely difficult to treat the various LD co-infections, and the immune dysfunction and endocrine problems present another challenge. Chronic LD patients often have additional bacterial and viral infections unrelated to their original exposure due to immune system dysfunction and the chance of additional opportunistic infections. These problems present physicians with complex problems that are often unique to each patient, and this requires complex treatments directed at the LD co-infections and also treatments to restore dysfunctional endocrine and immune systems.

What happens if Lyme disease is left untreated?

Chronic LD can progress to a fatal disease, but most patients become slowly disabled and are often diagnosed with other diseases or syndromes, such as Chronic Fatigue Syndrome, neurodegenerative diseases, Rheumatoid Arthritis or other diseases or illnesses. In the most severe forms, Chronic LD patients can have multiple diagnoses, and this form of LD is particularly difficult to successfully treat.

Have you done any clinical studies with patients with Lyme disease?

Most of our studies on Chronic LD have involved the laboratory diagnosis of various co-infections, such as *Mycoplasma* species, in Chronic LD using molecular genetic methods. For example, we were among the first to identify various *Mycoplasma* species in Chronic LD patients and determine the incidence of these co-infections among LD and non-LD patients. We also studied the incidence of various LD-associated infections in other diseases, such as Chronic Fatigue Syndrome, Fibromyalgia Syndrome, Autism Spectrum Disorders, etc. This has resulted in our suggestion that various LD-associated infections are very common in many chronic diseases. I have recently reviewed this topic, and copies of this two-part review in the British Journal of Medical Practitioners can be downloaded from our website, www.immed.org.

We have also worked on chronic fatigue and mitochondrial dysfunction in Chronic LD and other diseases and illnesses, and how this can be corrected. Mitochondria in our cells provide the high-energy molecules necessary for cellular metabolism and life. In Chronic LD and many other infection-based diseases the mitochondrial membranes are damaged by oxidative stress, resulting in leakage of the membranes and an inability to produce high-energy molecules. In patients with Chronic LD the mitochondria are only functioning at about one-half their normal capabilities, and this results in and is perceived as chronic fatigue.

Often fatigue is a major issue in Lyme disease, along with muscle weakness and headaches. Is there anything that can be done to assist with these symptoms as one is healing?

We and other LD experts have shown that chronic fatigue, muscle weakness and other symptoms in Chronic LD are related to loss of mitochondrial function. This is where our research with patients that have other chronic illnesses, such as Chronic Fatigue Syndrome and Fibromyalgia Syndrome, has helped in Chronic LD. All these patients have somewhat similar problems with excess oxidative stress and damage to their mitochondria. We have found that Lipid Replacement Therapy with oral NT Factor or the replacement of damaged mitochondrial membrane lipid components with undamaged membrane phospholipids can restore mitochondrial function and significantly reduce fatigue.

How can repairing cell membranes help someone with Lyme disease?

As in other chronic diseases, cellular membranes in Chronic LD patients are often damaged by excess oxidative stress, especially the very sensitive cellular membrane and mitochondrial membrane phospholipids. These phospholipid molecules form the matrix or main barrier of all of our cellular membranes, and when they are damaged by oxidation, they allow our membranes to become leaky and permit ions and other small molecules to leak out of our cellular organelles such as mitochondria and even our cells. It is especially important in nerve cell membranes as well as in the membranes in various cells of the immune system that membrane barriers provide electrical and ionic differences across the membranes. When the membranes leak, cellular function is impaired. We have used Lipid Replacement Therapy with oral NT Factor to help restore cellular membranes and especially membrane function. In patients with Chronic LD as well as other chronic diseases restoring membrane function resulted in significantly reduced fatigue and better functioning cells. This translated into better quality of life.

Are there products you recommend for quality of life while undergoing treatment for this disease?

I certainly recommend the products that contain NT Factor® for Chronic LD patients as well as many other diseases where membrane function, especially mitochondrial function, has been impaired due to excess oxidative stress. An important point is that NT Factor doesn't interfere with the usual treatments for Chronic LD, so it is an important adjunct to any of the therapies used today to treat Chronic LD and the various infections that are present in Chronic LD.

About the Author:

Professor Garth L. Nicolson is the President, Chief Scientific Officer and Research Professor at the Institute for Molecular Medicine in Huntington Beach, California. Professor Nicolson has published over 600 medical and scientific papers, edited 16 books, and served on the Editorial Boards of 30 medical and scientific journals. Professor Nicolson has won many awards, such as the Burroughs Wellcome Medal of the Royal Society of Medicine (United Kingdom), Stephen Paget Award of the Metastasis Research Society, the U. S. National Cancer Institute Outstanding Investigator Award, and the Innovative Medicine Award of Canada. He is also a Colonel (Honorary) of the U. S. Army Special Forces and a U. S. Navy SEAL (Honorary) for his work on Armed Forces and veterans' illnesses.

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