Social/Emotional Stress and Autoimmune Disease

Social stress elevates pro-inflammatory cytokine interleukin-6 and worsens autoimmune disease symptoms in mice, according to research by Mary W. Meagher, PhD, at Texas A & M University and colleagues. The researchers placed an older, aggressive male mouse into the "residence of three young mice...who had established a stable social hierarchy" for two hours – one mouse each night for six consecutive nights. The young mice were infected with Theiler's murine encephalomyelitis virus. This virus produces an acute central nervous system infection that develops into a chronic autoimmune response similar to multiple sclerosis. The stress caused by the aggressive "intruders" caused a rise in interleukin-6 levels in the serum and brain in the younger mice and also produced more severe MS-like illness.

In a second experiment, the researchers injected the younger mice with an IL-6-neutralizing antibody during the stressful period. The antibody inhibited IL-6 elevation and reduced MS-like symptoms. These mice showed less motor impairment, inflammation of the brain and spinal cord, and CNS viral infection than the mice that did not receive the neutralizing antibody. Dr. Meagher's research was presented at the 115th American Psychological Association Convention (Session 1157), held August 17-20, 2007. The abstract was published online by Brain, Behavior, and Immunology on June 25, 2007.

Up to 80% of people with autoimmune disease who have taken part in retrospective studies reported "uncommon emotional stress" before their illness arose, say Serbian researchers L. Stojanovich and D. Marisavljevich. Dr. Meagher's research indicates that inhibiting the pro-inflammatory cytokine response to social conflict could reduce people's risk of developing serious illness. She says that human clinical trials are needed to evaluate the effectiveness of anti-inflammatory drugs, exercise, antidepressants, omega-3 fatty acids, and mindfulness meditation/relaxation training to lessen the inflammatory response caused by social stress. Reducing the physiological response to stress may be a key to reducing symptoms in autoimmune disease. As the Serbian researchers state, "...not only does stress cause disease, but the disease itself also causes significant stress...creating a vicious cycle."


Multiple Sclerosis, Grave's Disease, and Excitotoxins

For years, internist H.J. Roberts, neurosurgeon Russell L. Blaylock, and other physicians have warned that monosodium glutamate (MSG) and aspartame break down into excitotoxins and cause neurological damage. In nature, excitotoxins are amino acids, such as glutamate, aspartate, and cysteine, which excite the nervous system. When these amino acids are obtained through whole foods, they are bound in amino acid groupings. When MSG and aspartame break down, they produce high levels of free amino acids that over-stimulate nerve cells and literally excite them to death. In recent years, independent researchers have produced more evidence of the damage caused by excitotoxins.

People with multiple sclerosis have an increased risk for glutamate excitotoxicity. Oligodendrocytes, one type of cell that forms the myelin sheath surrounding neural axons, “appear to be predominant cells for glutamate clearance in human white matter of the brain,” says David Pitt and colleagues at Albert Einstein College of Medicine (Bronx, New York). Their research indicates that an autoimmune attack, possibly by the proinflammatory cytokine tumor necrosis factor-α (TNF-α), may be responsible for damaging glutamate transporters on oligodendrocytes near MS lesions and inhibiting glutamate uptake. As these oligodendrocytes die from the build-up of glutamate (excitotoxicity), more lesions form. Genetic and biochemical individuality may explain why some people are more sensitive to excitotoxins than others. “Any dietary excitotoxin can activate the microglia [interstitial cells in the central nervous system that collect waste products], thereby greatly aggravating the injury,” writes Dr. Blaylock. "This includes the aspartate in aspartame."

Multiple sclerosis is not the only autoimmune disease associated with excitotoxins. Justin Dumais, a 25-year-old competitive diver, was diagnosed with Grave's disease in December 2003. Grave's disease is characterized by nervousness, hand tremor, weight loss, fatigue, breathlessness, palpitations, increased metabolic rate, GI motility, and other signs of hyperthyroidism. On the advice of a nutritionist, he eliminated aspartame from his diet in mid-March 2004, particularly diet soda. Within
three months, he was no longer on thyroid medication and was able to compete at the 2004 Olympic games. Dr. H.J. Roberts and the Aspartame Consumer Safety Network have collected several cases that link diagnoses of Grave's disease with aspartame use. Symptoms of Grave's disappear when aspartame use is discontinued and resume with the chemical's use, even if exposure is "accidental."

While monosodium glutamate and aspartame are easy to identify on processed food labels, many excitotoxins are "hidden" under a variety of names: hydrolyzed (an extraction process) proteins, hydrolyzed oat flour, sodium caseinate, calcium caseinate, yeast extract, textured protein, and autolyzed yeast. Soybean extracts are especially problematic because soybeans are very rich in glutamate. Hydrolyzing soybeans frees the glutamate, producing higher levels of the excitotoxin than that found in the same amount of MSG. Sometimes MSG is added to malt extract, bouillon, broth, stock, natural flavoring, natural beef or chicken flavoring, seasoning, and spices listed on a label. Salad dressings are notorious for using MSG. The only way for people to avoid excitotoxins is to cook and eat whole foods at home. Restaurants and hospitals often receive their foodstuffs without ingredient lists. While the facility may not add MSG, staff has no way to know if MSG or aspartame has been added to the processed foods they are using. Avoiding excitotoxins for several weeks is the only way to tell whether MSG or aspartame is contributing to (or even causing) one's symptoms.


Autoimmune Disease and Environmental Triggers

About one in 31 Americans has an autoimmune disease, according to Jonathan J. Powell and co-authors. Why do so many people have immune systems that have turned against them? By studying identical twins, researchers have determined that certain genetic combinations make a person more susceptible to autoimmune disease, but environmental and lifestyle factors, particularly factors found in industrialized countries, seem to incite the actual disease expression and exacerbation. People living in Western countries have a higher risk of autoimmune disease: "... immigrants take on the same incidence of disease as the indigenous population and in some cases even exceed it" (Powell et al.).

Industrial chemicals, organic solvents, certain pharmaceuticals, metals, and pesticides are among the xenobiotics (chemicals foreign to the body) that have been linked to autoimmune diseases. Occupational exposures to vinyl chloride and to silica dust (e.g., mining, sandblasting, sculpture) contribute to some cases of scleroderma and mixed connective tissue disease. Submicron-sized, charged particles that attach to environmental or gut-residing antigens can also disrupt the immune system. No single chemical or particulate, however, appears to be a primary instigator of illness.

In contrast, specific pharmaceuticals, used for chronic disease, can produce lupus-like disease in susceptible people. The condition dissipates when medication stops. Procainamide and quinidine (antiarrhythmics) and hydralazine (antihypertensive) account for most drug-induced lupus cases. Long-term use of one of these high-risk drugs produces drug-induced lupus in five percent to 20% of recipients, according to the Lupus Foundation website.

Estrogen replacement therapy in postmenopausal women increases the risk of lupus, scleroderma, and Raynaud's disease. L. Fraenkel and colleagues conducted a study involving 497 postmenopausal women (Ann Intern Med. 1998;129:208-211): "The prevalence of Raynaud phenomenon (an ischemic condition associated with autoimmune disease) was 8.4% in women not taking hormone replacement therapy, 19.1% in those receiving estrogen alone, and 9.8% in those receiving estrogen plus progesterone." Because of the correlation between estrogen supplementation and Raynaud’s, some researchers have wondered if chemicals in the environment that have estrogen-like effects might also be contributing to the increase in autoimmune disease. Little evidence is available of such a link at this time.

Another medical intervention associated with autoimmune disease is vaccination. A quick Google search produces several case reports in medical literature of Guillain-Barré Syndrome arising after influenza or hepatitis B vaccination. Multiple sclerosis has also been connected to the hepatitis B vaccination, and autoimmune thrombocytopenia is linked to the MMR vaccination, according to Vered Molina and Yehuda Shoenfeld. These Israeli researchers say, "Better understanding of these environmental risk factors will likely lead to explanation of the mechanisms of onset and progression of autoimmune diseases and may lead to effective preventive involvement in specific high-risk groups."


**DIRECT-MS**

When his son was diagnosed with multiple sclerosis (MS) in 1995, research scientist Ashton F. Embry scoured the scientific literature for possible causes of the disease and for effective treatments. Embry checked proposed environmental triggers against epidemiological patterns. The highest incidence of multiple sclerosis occurs at higher latitudes (toward the poles) in the US, Canada, Western Europe, New Zealand, and Australia. He concluded that diet – a high consumption of dairy foods, gluten grains, and saturated fats – is the only environmental factor that explains certain paradoxes. For example, Japanese descendants who live in Hawaii are more likely to get MS than Japanese living in their homeland, but Hawaiian Caucasians have a lower rate of MS than Caucasians who live on the mainland. Embry attributes this seeming contradiction to the fact that Japanese-Hawaiians are more likely to eat dairy and gluten grains that can cause hypersensitivity reactions than those living in Japan. In contrast, Caucasians in Hawaii eat more fish and fresh produce (and fewer reactive foods) than those on the mainland.

Embry found empirical support for his hypothesis that MS’s main environmental trigger is diet: “...abundant anecdotal data indicate that many people have achieved either a permanent remission or a significant slowdown in disease progress through diet revision involving the elimination of hypersensitive food,” he writes. The diet that he deduced from these anecdotal reports proved to be very helpful for his son, who “remains in excellent health with no MS symptoms,” and others. As a result, Embry, his wife, and colleagues set up DIRECT-MS (Diet Research into the Cause and Treatment of Multiple Sclerosis), a federally registered charity based in Calgary, Alberta, Canada.

DIRECT-MS.org has produced an online, 60-page booklet of recipes with dietary guidelines for people with MS. The diet eliminates allergenic foods (those identified by skin and ELISA tests) and proteins that may trigger autoimmune reactions: all dairy products, gluten grains, and legumes (beans, soy, peanuts, peas). Fish, skinless chicken breast, and turkey are the primary sources of protein with lean red meat permitted no more than once per week. Plenty of fresh fruits and vegetables for micro-nutrients, fiber, and needed carbohydrates are also recommended. Candy, soft drinks, and foods with a high sugar content – all of which alter gut flora and contribute to intestinal permeability (leaky gut) – are disallowed. Because people with MS have done well on a diet low in saturated fat, DIRECT-MS recommends using olive oil as the fat source. The website also has a list of recommended supplements. Vitamin D3, omega-3 fatty acids, calcium, and magnesium are considered essential. Testimonials about the diet, posted on the organization’s website, report a remission of symptoms and even, in some cases, a disappearance of lesions.

DIRECT-MS is funding two clinical trials that are under the direction of established MS researchers. The first trial is a dose/safety study of vitamin D for people with multiple sclerosis. The second trial will involve 30 people with relapsing-remitting MS and EDSS disability between 0 and 3.5. Fifteen patients will follow the diet recommended by the MS Society for one year. This diet focuses on avoiding saturated fat. The remaining 15 will follow DIRECT-MS’s Best Bet Protocol, as outlined above. In addition to disability assessments, questionnaires, and physical-neurological medical evaluations, the participants will undergo several MRI scans throughout the study to measure lesions and brain volume. With so little formal research into the effect of diet on MS, these studies will be a welcome and much needed addition to the literature.

**Emotional Freedom Techniques and Autoimmune Disease**

As I was looking for information about stress reduction and autoimmune disease, I came across three pretty amazing case reports from practitioners of Emotional Freedom Techniques (EFT). EFT is an acupressure technique that uses tapping to relieve emotional traumas and reduce stress. (See “Shorts,” Townsend Letter. 298;38-39.) These reports really stretch our current understanding of the mind-body connection.

In the first report, EFT practitioner and certified postpartum doula Alina Frank used EFT to address her own Hashimoto’s thyroiditis. She had developed the autoimmune disease six months after giving birth to her stillborn daughter. For 13 years, Frank had sought healing via Chinese herbs, acupuncture, homeopathy, nutrition, and other alternatives. Her endocrinologist kept telling Frank that she would “most likely have to take [synthetic thyroid hormone therapy] for the rest of [her] life.” When Frank began working with EFT, she realized that several unresolved emotional issues concerning her daughter’s death were “somehow trapped in [her] thyroid.” She used EFT to address these emotional issues as well as the symptoms of hypothyroidism and any other associations that she believed kept her from healing. Frank does not specify how long it took before she noticed a physical change. Eventually, however, she began experiencing insomnia, tinnitus, and other symptoms of hyperthyroidism, caused by an overdose of the thyroid...
medication she was taking. With the help of her nurse practitioner, Frank was able to discontinue the synthetic hormone therapy. At the time of her report, Frank had been medication-free for eight months.

In the second report, Estelle Toby Goldstein, MD, writes about a 50-year-old man who sought help for Sjögren’s syndrome. Sjögren’s is an autoimmune condition in which white blood cells attack glands that produce moisture. In this man’s case, a lack of saliva had caused tooth damage, requiring the removal of two molars and threatening the health of two more. The man was already taking Salagen-brand pilocarpine to relieve dry mouth. Unlike Alina Frank, this man did not report any signs of depression or emotionally charged life events. Rather, he associated the illness’ onset with a dream he had had about the movie The Fly, starring Jeff Goldblum. “Somehow, when his mouth became dry, he had the feeling he was becoming a fly as if he were in the movie,” Dr. Goldstein writes.

Dr. Goldstein followed the EFT Basic Recipe (see www.emofree.com) several times, focusing on his symptoms and on forgiving his mouth, teeth, and the practitioners who had treated him. Then, Dr. Goldstein instructed the man to tap the thyroid area on his left hand while imagining himself in a theater, watching The Fly. He “saw” all the major scenes from beginning to end, then from the end to beginning. At that point, Dr. Goldstein instructed the patient to visualize “leaving the theater, and the movie’s name being taken off the marquee as it would not run again.” She had him perform another round of EFT while affirming his ability to move forward and leave The Fly and dry mouth behind. When this final round of tapping ended, Dr. Goldstein asked the man to relax and “blow his problems out to the universe.” To the surprise of both the man and Dr. Goldstein, “[h]e started to literally froth at the mouth, producing so dramatic an amount of saliva that he started drooling all over his shirt and we needed some tissues to clean things up.” At an eight-month follow-up, the patient had not used salivary stimulants or pilocarpine for several weeks, and he had had “no further dental damage.” (This case makes me wonder what “movies” are still replaying in my psyche!)

The third case involves a German man with systemic progressive scleroderma who was having problems with his esophagus in addition to the characteristic hardening of the skin. After the first transatlantic EFT phone session, the man told EFT practitioner Baerbel Froehlin that a finger wound that had not healed in over a year broke open and expelled “a lot of pus,” then closed cleanly. After a second session, he began to experience tingling in his hard, numb fingers. Over six weeks, he was able to cut down on his medications because pain and inflammation had decreased. A blood test documented the decrease in inflammation. He was able to swallow without any problem. At that time, Froehlin reported, “The emotional improvement is amazing...He needed to turn his life around quite a bit and he did! He now takes times out during the day for himself, to rest, to pause, to do some exercise.”

The man flew to Froehlin’s practice in the US for two weeks of intensive work with EFT, hypnosis, journaling, and art therapy. “The day he left for the airport,” Froehlin writes, “he told me he felt ‘profoundly’ convinced that he is going to get better....As soon as he was on the plane back to Germany, his pain level, which had been consistently low for months, shot up into extreme heights....Back home, he had blood work done which showed high inflammation counts.” One would expect the patient to be extremely disappointed, but he wrote Froehlin to thank her for the COMPLETE emotional well-being he is enjoying...He talks about ‘looking forward into the future optimistically.’” Froehlin, herself, was disappointed with the result. She, however, came to realize that the illness gives this man a culturally acceptable excuse for selling his prosperous stone masonry business and choosing “an easy life without the hard work.” The man’s father told Froehlin that “he has never seen his son as ‘alive and well’ emotionally as now....There is a deep calm about my son that was never there before!” As Froehlin says, healing takes a variety of forms.

“We make no specific medical claims for EFT,” says Gary Craig, the Stanford-trained engineer who developed EFT, “but we agree with medical experts who say that by...
Shorts

relieving past traumas and improving the body’s flow of energy, EFT can help most patients improve their health.” A free EFT Manual that explains the basics is available at www.emofree.com/LearnEFT.htm. The website also sells EFT training DVDs and advertises live workshops.


Ultrasound Blood Irradiation

For decades, both medicine and industry have recognized and used ultraviolet light (UV) to kill pathogens. Niels Ryberg Finsen, a Danish physician and scientist, gained a Nobel Prize in Medicine and Physiology in 1903, for pioneering UV therapy with his phototherapy treatment of lupus vulgaris (tuberculosis of the skin, a bacterial infection not related to SLE). His treatment had a 98% success rate. Emmett Knott, a physicist, built on Finsen’s work by developing an effective means of using UV radiation to combat internal infections. He withdrew about 1.5 cc’s of blood per pound of body weight from a vein, citrated the blood to prevent coagulation, then exposed it to UV radiation by running it through a small radiation chamber before re-injecting the blood back into the vein. The “Knott technique” gained interest from other physicians when Knott and collaborating obstetrician Dr. Virgil K. Hancock published a 1934 article about their experiences with UV therapy. During the 1940s, several American hospitals accepted UV blood irradiation as a highly effective and very safe way to treat infections, including pneumonia (bacterial and viral), septicemia, hepatitis, and acute polio. Interest died out with the arrival of antibiotics.

Ultraviolet Blood Irradiation (UVBI) does more than inhibit bacteria and viruses. Its documented effects, according to Robert Jay Rowen, MD, include an increase in the blood’s oxygen-combining power, activation of steroids, increased cell permeability, activation of sterols into vitamin D, increase in red blood cells, and white cell count normalization. UV apparently also has “a remarkable effect on the autonomic nervous system,” according to a report by E. W. Rebbeck who used the therapy in the 1940s to relieve post-surgical paralytic ileus (decrease/absence of intestinal movement). More recently, German researchers have investigated the use of UV blood irradiation for vascular problems, such as peripheral arterial disease and Raynaud’s disease. They report an increase in painless walking, improved claudication distances, and decreases in plasma viscosity. Autoimmune disorders, including scleroderma and rheumatoid arthritis, have responded to UV blood irradiation too, according to Dr. Jonathan V. Wright.

Ultraviolet radiation is also a cancer therapy. The US Food and Drug Administration approved ultraviolet treatment, used along with 8-methoxypsoralen (a photosensitizing agent), to treat cutaneous T-cell lymphoma. Dr. Robert Olney used ultraviolet blood irradiation, in conjunction with detoxification techniques, dietary changes, nutritional supplements, and the Koch catalyst to treat a variety of cancers. His pamphlet Blocked Oxidation, privately printed in 1967, recounts cancer reversal in patients with generalized malignant melanoma, highly metastatic colon cancer, thyroid cancer, uterine cancer, and breast cancer penetrating the chest wall and lung.

A Russian study assessing complications in 2380 sessions of UVBI therapy reported that 1.3% of the sessions had "complications associated with the technical performance of the manipulation." Twelve patients also reacted to the ultraviolet blood irradiation itself: “rigor in 4 cases, hypotension in 2 cases, nasal bleeding in 3 cases, hypoglycemia in 1 patient, bronchospasm in 1 patient and urticaria in 1 patient.” Eating carbohydrates for an hour or two after the session helps prevent complications.

The International Oxidative Medicine Association (Oklahoma City, Oklahoma) sponsors UVBI workshops and seminars. Phone 405-634-1310 for more information.

Varaala O. Type 1 Diabetes

Cow’s milk, vitamin D, and insulin taken by diabetic parents are among the factors that may affect whether or not a genetically susceptible child acquires type 1 diabetes. Type 1 diabetes is an autoimmune disease in which the immune system attacks and destroys insulin-producing beta cells in the pancreas in children and young adults. (Type 2 is characterized by insufficient insulin and insulin resistance.) Outi Vaarala, Professor of Pediatric Immunology at University of Linköping (Sweden), performed several studies that link an infant’s consumption of cow’s milk to increased risk of acquiring type 1 diabetes. She says that “...infants who have been exposed to cow-milk formulas before the age of three months have higher levels of insulin-binding antibodies and T-cell reactivity to insulin than infants who have been exclusively breast-fed.” Interestingly, children of diabetic mothers have a lower immune response to insulin than children with diabetic fathers, according to Johanna Paronen. She proposes that a baby’s exposure to maternal diabetes or insulin therapy during pregnancy and early infancy (through breast-feeding) teaches the infant’s immune system more tolerance to insulin and insulin-producing cells.

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Several European studies indicate that vitamin D supplementation can decrease type 1 diabetes risk. In one trial, women's cod liver oil consumption during pregnancy significantly reduced the risk of type 1 diabetes in their offspring (L.C. Steine et al. Diabetologia. 2000;43:1093-8). A Lancet 2001 prospective study, by E. Laara Hyppönen and colleagues, looked at the effect of infant supplementation during the first year of life. Offspring who received vitamin D supplements regularly during their first year had a 0.12 relative risk, compared to those without supplementation. These children grew up in Northern Finland, an area that gets little D-promoting sunlight. Those receiving more than 50 micrograms/day had the lowest relative risk. US gets little D-promoting sunlight. Those receiving more than 50 micrograms/day had the lowest relative risk. US children receive the US recommended dietary intake for babies up to one year is five micrograms per day.

Type 1 diabetes has no cure at this time, but researchers at the University of British Columbia announced a potential breakthrough in May 2008. They used genetic engineering to alter K cells in mice. Normally, K cells, which reside in the gut, secrete glucose-dependent insulinitropic polypeptide, a hormone that turns on insulin production when food is in the digestive tract. These genetically altered cells, however, actually produce insulin. As an additional benefit, the animal’s immune system ignores the altered K cells. Previous attempts to transplant functioning beta cells into a patient’s pancreas have required the use of immunosuppressive drugs because the immune system attacks the new cells. If this K cell therapy works in humans with type 1 diabetes, their bodies will make insulin and end the need for immunosuppressive drugs, continual blood sugar/insulin monitoring, and insulin injections.

Lupus Erythematosus and Herbs

Eric Yarnell, ND, and Kathy Abascal, JD, RH (AHG), present information about herbs used to treat systemic lupus erythematosus (SLE) and other autoimmune diseases in Alternative & Complementary Therapies (February 2008). Some, such as Trametes versicolor and Cordyceps sinensis, have immunomodulating properties (i.e., a regulating effect). T. versicolor was formerly known as Coriolus versicolor. PSK, a extract made from T. versicolor, improved lupus symptoms in a preliminary study in 1960. Yarnell and Abascal found no follow-up lupus studies. They say, however, that large cancer trials using PSK and similar extracts testify to the botanical’s safety at a dosage of one to three grams per day. The fungus Cordyceps sinensis is among the herbs that increase interleukin-2 production in SLE, according to preliminary Chinese research. Interleukin-2 is an immunoregulatory cytokine that tends to be low in people with lupus. Artemisia annua and Artemisia apiacea may also have immunomodulating effects although some studies indicate that Artemisia may simply suppress immune activity and have anti-inflammatory effects. In Chinese research, A. annua, A. apiacea, and artemisinin (a component of these herbs) have helped people with SLE, according to Yarnell and Abascal.

Tripterygium wilfordii has anti-inflammatory and immunosuppressive properties. In a small open trial, people with systemic lupus or discoid lupus took 5g of whole root and stem given three times per day, or prednisone. The Chinese researchers B.X. Wang and Z.Z. Yuan reportedly found that the T. wilfordii and prednisone “were in general equally effective, although T. wilfordii eased arthralgia and rash significantly more effectively than did prednisone.” Another Chinese study reported that 30-45 grams daily of decorticated T. wilfordii stems and roots decreased symptoms and improved titers of anti-nuclear antibodies and lupus erythematosus cell counts. T. wilfordii does have some safety issues. Yarnell and Abascal say that the bark contains nontherapeutic alkaloids that may cause amenorrhea, male infertility, kidney damage, and leukopenia. Long-term use of the herb may also decrease bone mineral density, “although this is not as severe as that seen in women who take prednisone.”

The one botanical that Yarnell and Abascal recommend that people with lupus avoid is alfalfa: alfalfa seed, sprouts, and tablets. Alfalfa sprouts and tablets have induced SLE in primates and have worsened SLE in humans. Canavanine, an arginine homologue found in alfalfa, is believed to be the source of the problem.

