Lyme Updates

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Online Lyme Support Group for Buhner Protocol

Dear Lyme friends and friends of people with Lyme Disease,

We have started a new online Lyme support group for people who are using the new Stephen Buhner protocol to treat Lyme disease, which uses herbs and supplements instead of prescription antibiotics or in addition to prescription antibiotics.

Lyme Aid Buhner is a support group designed for discussing the alternative treatment ideas Stephen Buhner talks about in his book "Healing Lyme: Natural Healing and Prevention of Lyme Borreliosis and Its Coinfections" (published in 2005).
Please note that none of us are experts on this protocol, and we are not offering any medical advice. Discussion will focus on individual experiences with this protocol. Purchasing the book should be your first step to understanding the ideas and experiences being discussed in this group.

The Lyme Aid Buhner's main webpage is found here:
http://health.groups.yahoo.com/group/Lyme_Aid_Buhner/ .

To Subscribe, send an email to:
Lyme_Aid_Buhner-subscribe@yahoogroups.com

Robynn Harris has generously offered to moderate this list using guidelines similar to her Lyme Aid list.

Please share this info about our new group with anyone who might be interested in using this herbal Lyme protocol.

May gratitude and wonder nourish our healing, breath by breath and step by step.

Contacting me

Due to the high volume of emails I have been receiving it has become apparent that I don't have the time to respond in detail to the many queries I am receiving.
I do appreciate your contacting me about lyme, however, please know that the chances are ever higher that I may not be able to respond to your queries. So, please don't take it amiss if you do not hear back from me.

Corrections to the book

HEALING LYME

Page 106, under "Specific indications for Lyme disease:" last line. This should be "bartonella coninfection." NOT "ehrlichia coinfection."

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Andrographis adverse reaction

There has been a number of reports of people using this protocol who have experienced a severe rash from the use of andrographis. In general, about one percent of people using the protocol experience a rash, one out of every hundred. The rash most often looks like hives and can cover much of the body. It will clear upon discontinuing andrographis, but can take up to a month to completely do so (normally 10 days to two weeks). The scientific literature on andrographis does note that allergic reactions can occur, so caution should be exercised in its use. If you do experience allergic reactions while on the protocol, the most likely cause is the andrographis. Discontinue this herb and after reactions clear, you can reintroduce it at low doses, carefully.

A note on the protocol

A note on the protocol: The most important things to remember intreating lyme infection are (in order of importance): 1) introducea strong and aggressive collagen
support protocol. This will helpprotect the body from the many symptoms that come
from collagen destruction by the lyme spirochetes. 2) initiate an immuneenhancement protocol. This will stimulate your immune system to aggressively combat the infection. 3) introduce herbs that will counteract the primary inflammatory pathways that the spirochetesinitiate. This will reduce many of the symptoms of the disease. 4) introduce antispirochetal medicines, whether herbal orpharmaceutical.

Do I see Clients?

I no longer see individual clients as of fall of 2005.

Lyme literate practitioners with experience in this protocol

In addition to those listed in my book I can recommend the following Lyme literate practitioners. All of them have some familiarity with the protocol in the book.

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TOP

Apis and Bi-edta in the treatment of Lyme disease - article

THE USE OF APIS AND BI-EDTA IN THE TREATMENT OF LYME DISEASE
By Stephen Harrod Buhner

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This article was originally intended to be included in my book on Lyme disease: Healing Lyme, as an appendix. Due to space considerations, it was deleted and is published here for those who are interested.

As research into borrelia treatment continues, increasing numbers of natural substances will be tested for activity against the organism and, over time, more potent herbal and natural treatments will be discovered. To date there are two substances other than antibiotics that have been tested and are active against Lyme borrelia organisms: melittin from bee venom, also known as apis, and BI-EDTA (bismuth). This is a brief look at their actions and potential uses.

Both of these substances are hard to find, both have potentially serious side effects if used inappropriately, nevertheless both, especially apis, have been used effectively in clinical practice. Apis has the longest tradition of use and in spite of nervousness about its use among both herbalists and physicians, historical and contemporary clinical outcomes with apis are excellent and side effects extremely uncommon. Please read the side effects section carefully.

APIS
Source: Bee venom
Chemical constituents: 40-50% of bee venom is melittin. Bee venom also contains a number of other compounds: apamin, mast-cell degranulation peptide 401, secarpin, tertiapin, adolapin, protease inhibitors, provamine A and B, minimine, cariopep, phospholipase A2, hualuronidase, acid phosphomonoesterase, glucosidase, lysophospholipase, histamine, dopamine, norepinephrine, leutotriens, glucose, fructose, numerous phospholipids, r-aminobutyric acid, B-aminosobutyric acid. Medicinal actions: Melittin is powerfully antibacterial, more potent than many commercial pharmaceuticals, and is anti-inflammatory. It stimulates the hypophyseal-adrenal system and produces cortisone. Melittin also stabilizes the lysosome cell membrane, protecting against inflammation.

Apimin is a mood elevator and anti-inflammatory. It works like melittin to produce cortisone and inhibits the part of the complement system (C3) which is involved in inflammation.

Mast cell degranulating peptide (MDC peptide or peptide 401) is an astonishingly potent anti-inflammatory, 100 times more effective than hydrocortisone in reducing inflammation. It blocks arachidonic acid production and inhibits prostaglandin synthesis. Adolphin is both an anti-inflammatory and pain killer. It inhibits microsomal cyclooxygenase and is 70 times stronger than indomethacin. Adolphin also inhibits platelet lipoxygenase - and thromboxane and prostacycline which are activated during inflammation.

The protease inhibitors in venom inhibit carrageenin, prostaglandin E1, bradykin, and histamine induced inflammations. They also inhibit chymotrypsin and leucine-aminopeptidase.

Bee venom is a potent antioxidant, antifungal, antibacterial, antiinflammatory,

and possesses radioprotectant actions. It has been found to exert powerful actions as an antibacterial agent, anti-inflammatory, antiarthritic, antirheumatic, in neurodegenerative disease, as a cardiotonic, an antioxidant, and as a diaphoretic and diuretic. It has also been found to be a strong immunological agent, stimulating the body's protective mechanisms against disease. The Eclectic Botanical physicians considered it to be a potent alterative.

An alterative - smilax is one - is generally considered a tonic herb or substance that gradually restores proper function to the body. Historically, the term generally referred to herbs that could cleanse the blood, basically bind- endotoxins, reduce blood toxicity, infections, and skin problems. They gradually alter (hence the name alterative) a pathological condition and restore normal function and capacity.

Current uses in Asia and Europe are primarily focused on the treatment of rheumatic conditions, arthritis, gout, neuralgia, multiple sclerosis, and cancer. Some newer research shows that melittin has a powerful capacity to shrink tumors. History of Apis: Bee venom has at least a 3000 year history of use in China and nearly that long in Japan and Korea. The Romans used it as a powerful pain killer and the ancient Greeks used it as well. It is an integrated element of medical treatment today in China, Japan, Korea, Taiwan, Russia, Eastern Europe (Bulgaria, Czech Republic, Hungary, Poland, Romania), in certain Western European countries (Austria, Germany, Switzerland, France), and is growing in use in South America. It was a regular part of American medical practice, primarily homeopathic and Eclectic Botanical practice from 1847 until World War II. It is still commonly used by homeopaths. In Eclectic Botanical practice a tincture of Apis, taken orally, was used.

The Eclectics used it primarily for healing diseases of the urinary tract, especially when there was a desire to urinate but an inability to do so. A list of conditions for which they used it are: suppression of urine, urethral and cystic irritation, especially with tenesmus; chronic nephritis; cystitis; menorrhagia; amenorrhea; leucorrhea; genital puffiness; labial inflammation; sore throats; dropsy; traumatic injuries of the subcutaneous tissues; rheumatism; subcutaneous inflammations. Dry, hot, red conditions, inflammation of the skin, internal organs, or brain and central nervous system. In general hot, red, or puffy conditions, especially of the mucous membranes and disorders of the urinary tract.

Apis entered the American pharmacopoeia in 1847 through a member of the Narragansett tribe, "a woman strolling by" as the original source puts it. She suggested its use in the treatment of a 12-year-old boy who had been suffering for some time with a degenerative condition and for which nothing seemed to work. The indigenous peoples of the Americas had a long history of the use of bee stings in healing.

Collection: Originally the whole bee was used, often placed in a closed container which was shaken to "excite their anger." They were then macerated in alcohol and a tincture made for medical use. Nowadays collection is much more benign and controlled.

Venom collection is best when there is a good nectar flow and the temperature is warm. The collecting device is a wire grid which the bees touch when entering the hive. A mild current flows through the grid which stimulates them to release venom. The bees are not killed in this process as they are in actual bee sting therapies or in the older processes of making Apis. The electric current induces spasms that stimulate the bees to deposit venom onto a collection plate. The venom is allowed to dry and then scraped off. It takes the veno from about 9,000 bees for one gram of dried bee venom.

The venom is generally found in two forms: a rougher, brownish powder that is unpurified and a more purified form that has undergone some processing after collection. Usually it is this latter form that is used in bee venom therapy. Some liquid forms, prepared from the purified powder, are also available. Normally they are used by physicians when preparing injectable forms of apis. About apis and Lyme disease: Interest in the use of bee venom for the treatment of Lyme disease has been stimulated by two things: 1) the finding that melittin is a potent antimicrobial for the Lyme spirochete; and 2) numerous practitioners have found it helpful in treating Lyme, the symptoms of Lyme, and conditions similar to Lyme disease such as multiple sclerosis.

Scientific studies: There are hundreds of studies on the use of Apis. These are composed of in vitro and in vivo studies, clinical trials, and clinical reports from

practitioners in its use for various disease conditions. Most of the studies are being conducted in Eastern Europe and Asia (primarily China). The two best sources for these are a PubMed or Medline search and the listing maintained by the American Apitherapy Society (AAS). The AAS has over 12,000 case reports of the use of Apis on file in addition to their many study listings. One source for many of those listings is maintained (as of 1/1/05) at the following web address: www.sci.fi/~apither/bdbindex.html.

Tests of melittin's inhibitory actions against Lyme organisms were carried out at the U.S. government's Rocky Mountain Laboratories Microscopy Branch, National Institute of Allergy and Infectious Diseases in Hamilton, Montana. The abstract overview is worth quoting in full:

> "Borrelia burgdorferi has demonstrated a capacity to resist the in vitro effects of powerful eukaryotic and prokaryotic metabolic inhibitors. However, treatment of laboratory cultures on Narbour-Stoenner, Kelly medium with melittin, a 26-amino acid peptide contained in honeybee venom, showed immediate and profound inhibitory effects when they were monitored by dark-field microscopy and optical density measurements. Furthermore, at melittin concentrations as low as 100 microg/mL, virtually all spirochete motility ceased within seconds of inhibitor addition. Ultrastructural examination of these spirochetes by scanning electron microscopy revealed obvious alterations in the surface envelope of the spirochetes. The extraordinary sensitivity of B. burgdorferi to melittin may provide both a research reagent useful in the study of selective permeability in microorganisms and important clues to the development of effective new drugs against Lyme disease. (Lubke LL and Garon CF. The antimicrobial agent melittin exhibits powerful in vitro inhibitory effects on the Lyme disease spirochete. Clin Infect Dis 1997 Jul; 25 Suppl 1:S48-51.)"

Apis (intramuscular injection) was used in a 12 month clinical trial (2000) of people with multiple sclerosis. It was found that Apis is effective in decreasing the functional debilitation caused by the disease. A ROSS survey, using Friedman nonparametric statistical analysis, found significant improvements in balance, coordination, bladder and bowel control, upper- and lower-extremity strength, fatigue, endurance, spasticity, and numbness. The "Activities of Daily Living" or ADL score improved significantly. Statistically significant improvements were seen in walking, stair climbing, car transfers, bed transfers, toilet transfers, bathtub transfers, and bed positioning. Sixty-eight percent of the people enrolled in the study experienced benefits from the use of Apis injections.

In 1992, a randomized, placebo-controlled trial of injectable Apis in the treatment of chronic pain and inflammation was conducted with 180 people. They were injected (IM) 2x weekly for 6 weeks. Significant post treatment reductions were seen in pain and inflammation. These reductions were still evident after 6 months.

A 1973 study of 326 people suffering from degenerative spinal conditions received bee venom cream using ultrasound. following treatment 60% reported being pain free, 30% said their pain had decreased.

A 1938 trial with 100 people suffering from arthritis found that after small dose injections of Apis 73% showed significant improvement in symptoms. Russian trials in the treatment of spondyloarthritis deformans with bee venom showed similar results.

A 1966 trial in the use of standardized bee venom for the treatment of arthritis found that 84% of 50 people benefitted.

A 1996 randomized trial of 101 people examined the efficacy of Apis injection in the treatment of osteoarthritis. Three different dosing regimens were compared with each other and to the non-steroidal antiinflammatory drug Nabumetone. All the participants suffered from degenerative osteoarthritis of the knee or spine or both. The researchers found that apis was significantly effective in treating osteoarthritis and in the reduction of symptoms.

Numerous recent trials in China (e.g. Kwon, 2001) have found that bee venom (BV) acupuncture is exceptionally safe and effective in the treatment of osteoarthritis. A 4 week comparison trial with 60 people of the effectiveness of BV

acupuncture versus traditional acupuncture found that bee venom acupuncture produced even more pain relief than acupuncture alone. Both were found effective. 82.5% of BV acupuncture patients rated the effectiveness of their treatment as either excellent or good. All patients reported pain relief and they improved significantly in a number of areas including infrared thermograph (IRT) readings; 18 of 26 patients' IRTs were normal after treatment.

A 1982 German trial in the treatment of 211 people with mesenchymal diseases of the locomotor system found bee venom to be effective.

There have been scores of in vivo studies on the actions of Apis, primarily in China and Korea. There are a number of mechanisms of action. Researchers have found that apis:

1) inhibits inflammation mediator generation by suppression of NF-kB (similarly to resveratrol).
2) alleviates thermal hyperalgesia through activating alpha2-drenoreceptors.
3) increases Fos expression in catecholaminergic neurons.
4) attenuates formalin-induced pain behavior and sinal cord fos expression.
5) reverses lipopolysaccharide-induced upregulation of such genes as IL-6 receptor, matrix metalloproteinase 15, tumor necrosis factor (ligand) superfamily-10, capase-6, and tissue inhibitor of metalloproteinase-1.
6) inhibits COX-2 activity and proinflammatory cytokines TNF-alpha and IL-1beta.
7) binds to secretory phospholipase A2 and inhibits its enzymatic activity.
8) modulates alpha 1-acid glycoprotein gene induction.
9) blocks neutrophil O2 production.
10) directly affects the production of IL-1 by macrophages, indirectly inhibits T and B cell activation.
11) is effective (as numerous in vivo studies have found) in the treatment of various forms of arthritis, including type II, collagen-induced.

Dosage: Tincture: 1-5 drops of a 1:5 tincture preparation; 5-20 drops of a 1:20 preparation, see "obtaining tincture of apis," below. Please see side effects.

NOTE: tincture of apis should be taken sublingually. That is, you should let it dissolve through the mucous membranes of the mouth. This allows it to flow directly into the blood stream without going through the stomach.

Apis does act systemically on the whole system and will pass the blood/brain barrier to act in the central nervous system. It is, however, excreted through the kidneys and it does stimulate urination as a result which is why the Eclectics found it of such benefit as a diuretic.

While Lyme spirochetes do locate in many regions of the body, one location they tend to cluster is the kidneys, though there have not been reports of kidney disease from the organism. The funneling of apis to the kidneys will also have a direct effect on spirochete clustering at that location.

Klinghardt (see "injectable") reports that injections of apis do act systemically in Lyme disease but that greater immediate effects on the alleviation of arthritic conditions occur when the injections are given at those locations, usually the knees.

Injectable: The primary physician using apis for Lyme disease is Dietrich Klinghardt. His article "The Treatment of Lyme Disease with Bee Venom" is available online (as of 1/1/05): www.neuraltherapy.com/a_lime_disease.asp. Klinghardt goes into explicit detail on his preparation, dosages, and uses of injectable apis in the article.

Generally, patients take the injections 1-3x weekly for 6-12 months. Because of the way the injections are given, there is little pain. Initial reactions are stronger during early injections than the later ones after physiological adjustment to the bee venom has occurred. Klinghardt reports NO negative reactions (i.e. severe allergic reactions) to injections in 20 years of practice. This matches the reports of East European, Asian, and Russian physicians.

Safety: Apis is exceptionally safe. There are NO reports in the literature on adverse side effects of the tincture or of the injections. The Eclectics were quite good with pointing out potential side effects - there are no reports over a 50 year period of side effects in their use of the tincture. Nor does extensive literature

searches show any side effects from the injections (other than transient local irritation, swelling, and itching). Nor does an extensive review of Asian literature including traditional Chinese and Korean medical use show anything other than that apis is very safe for use as a medicinal. Nevertheless, see "side effects."
Side effects: Every year a few people die from allergic reactions to bee stings - the percentage is very small. (Most sting deaths are from wasps, hornets, and yellow jackets which possess a much stronger venom.) Nevertheless, the use of apis must take this into account. APIS SHOULD NOT BE USED WITH ANYONE WITH A HISTORY OF ALLERGIC REACTIONS TO BEE STINGS. An Anakit or Epipen or other medically approved "bee-sting" kit should be on hand for the use apis and within immediate reach. The most common serious reaction to bee stings is airway constriction, these kits are made to deal with such severe side effects. ANYONE TAKING APIS TINCTURE SHOULD TEST TAKE ONE DROP OF THE TINCTURE TO DETERMINE NEGATIVE REACTIONS - AN ANAKIT OR EPIPEN SHOULD BE ON HAND. Testing for bee stingsensitivity with an allergist is also an excellent option if you desire to use this tincture in a treatment protocol.

Normally, when someone is using apis, as the body adjusts, larger doses may be taken. Beekeepers can withstand significant amounts of bee venom without adverse effects.
Contraindications: Apis can stimulate miscarriage. NOT to be used in pregnancy. Obtaining tincture of apis: Tincture of apis is not commercially available. The old eclectic formulation - a 1:5 formulation - is no longer legal in the United States. Homeopathic mother tinctures were originally 1:5, in 1920 this ratio changed to 1:10 and is now 1:20. This is a legal over the counter (OTC) preparation in the U.S. Dosage can be adjusted from the 1:5 preparations by multiplying by 4. In other words, if the original eclectic dosage was 1-5 drops, dosage with a 1:20 mother tincture would be 4-20 drops.

Homeopathic mother tinctures are commercially available can be purchased through homeopathic supply companies. Normally a physician or other licensed practitioner must order it. For homeopathic use: see the chapter in Healing Lyme on preventing Lyme.

BI-EDTA
Chemical Name: Sodium bismuth ethylenediamine-tetraacetate
About Bi-EDTA: Borrelia organisms are exceptionally sensitive to bismuth preparations. Bismuth is one of the most potent substances for killing the spirochetes.

A number of studies have been done on the use of Bi-EDTA against borrelia, primarily against Borrelia duttonii which causes East African Relapsing Fever. Most of the studies occurred in Italy in the 1950s. The studies repeatedly found that bismuth was active against these types of organisms. Antispirochetal effects were found from oral dosing of 25mg/kg in mice. Subcutaneous administration resulted in complete clearance of the spirochetes from the system within 3 days. About non-EDTA bismuth compounds: Recent in vitro studies found that bismuth is strongly active against Borrelia burgdorferi (sensu stricto) organisms in both its motile and encysted forms. Both new cysts (1 day old) and old cysts (8 months) responded to relatively low doses of bismuth - .125mg/ml and 2mg/ml doses respectively. Motile cysts needed a stronger concentration which was also found to be temperature sensitive: at 37 degrees centigrade 64mg/ml was necessary, at 30 degrees centigrade 256mg/ml was needed. However the longer the dosing lasted, the more susceptible the organisms became. After 2 weeks, at 37 degrees Centigrade inhibition began at only 2mg/ml. The bismuth aggregates attached to the cysts, penetrated the cyst wall, and strongly bound to borrelia blebs and granules. The researchers in this instance were looking at treating borrelia infections of the GI tract and so used ranitidine bismuth citrate, which is normally used to treat ulcers accompanied by Helicobacter pylori infection. A colloidal bismuth subcitrate formulation (De-Nol) is used to treat similar conditions such as duodenal ulcers and works in part by inhibiting campylobacter organisms (as well as H. pylori) which cause gastritis and damage the mucosal lining of the gut.

Bismuth is strongly active against numerous bacterial organisms. It was used in the 19th and early 20th centuries by the Eclectic botanic physicians primarily for gastric complaints, diarrhea, and so on, much as it is used today. Pepto-Bismol, in

fact, is a form of an old treatment for gastritis and came into existence about 1920 and has sold well ever since.

In spite of its broader antibacterial actions bismuth is mostly used in healing for treating GI tract disturbances, infections, and ulceration. The primary over-the-counter (OTC) bismuth preparation is Pepto-Bismol (liquid or tablets) or its generic knockoffs. Such formulations contain as the active ingredient bismuth subsalicylate.

Bismuth, in this form (bismuth subsalicylate) does not easily cross the gut mucosa into the blood stream. Both in vivo and human studies have found that large concentrations of converted salicylate do cross into the blood stream but only tiny amounts of bismuth do so.

In the GI tract bismuth subsalicylate is broken apart into salicylic acid (essentially - aspirin) and insoluble bismuth salts. More than 90% of the salicylic acid crosses into the blood stream. Less than 1% of the bismuth enters the blood stream. Both selenium and smilax (sarsaparilla) can enhance bismuth uptake through the GI tract mucosa. Most of the bismuth is, in fact, absorbed in the upper gut. Thirty milliliters (about one ounce) of Pepto-Bismol will increase bismuth concentrations in blood to their maximum about 4 hours after ingestion. Three doses daily - 30ml Pepto-Bismol every 4 hours - will increase serum bismuth concentrations to some extent. This uptaken bismuth is widely circulated in the body. Bismuth subcitrate (De-Nol) is more active in increasing blood serum concentrations, Pepto-Bismol and bismuth sucrose octasulfate are about the same in their uptake and much weaker. At the serum levels generated by these formulations, bismuth does not easily cross the blood/brain barrier but is present in measurable quantities in urine, blood, kidney, liver, and lung. To find measurably quantities in neuronal tissue outside the central nervous system 57mg/kg of bismuth subsalicylate was given to laboratory rats. Even at that dosage it did not cross the blood-brain barrier. The bismuth that is absorbed, however, is slowly excreted over a 3 month period of time. Much of the bismuth is of help in the GI tract mucosa where it helps strengthen the mucosa and protect against degradation and bacterial infection.

About EDTA: Known primarily as chelation therapy, EDTA became well known in the 1950s when it was (as it is still) considered appropriate therapy to remove or chelate heavy metals from the body. It is used, for example, in cases of lead poisoning, which is its primary medical use. It has also been found of benefit in helping chelate other metals from the body such as aluminum, arsenic, cadmium, mercury, and nickel.

EDTA use has expanded among alternative practitioners in the treatment of heart disease and vascular occlusion. This use is considerably controversial among conservative medical groups. Numerous practitioners insist they have found it of benefit in the treatment of many cardiovascular disorders including dissolving calcium deposits on arterial walls, some dementias such as Alzheimer's disease (which can be caused or stimulated by excess aluminum intake), arthritis, cancer, and kidney stones.

Normally EDTA is given intravenously (IV). However, a large number of EDTA supplements are on the market for oral use. Studies show that only 5-10% of oral EDTA is absorbed making it much less potent than IV EDTA. Oral dosing ranges from 500mg to 4000mg daily.

There have been a few studies of oral EDTA in the treatment of both cholesterol and blood pressure. In 20 patients who took 1 gram of EDTA daily for 3 months cholesterol in 9 patents (45%) dropped to normal and angina attacks lessened in frequency and duration in 5 (25%). Not great - there are better products out there for these conditions. IV use for heavy metal poisoning is very effective and some patients with severe heart disease have reported significant relief, avoiding surgery, with its use.

There are a number of different kinds of EDTA on the market: calcium EDTA (Ca-EDTA), aka calcium disodium EDTA, magnesium disodium EDTA, and magnesium dipotassium EDTA. Ca-EDTA is on the FDA GRAS list (Generally Recognized As Safe) and is an additive to many foods to preserve freshness. Because of this Ca-EDTA is widely available as a supplement. Generally, it is considered the safest oral form. Because EDTA can leach minerals from the body it is considered important to take a good mineral supplement along with it.

EDTA and bacterial pathogens: There is some evidence that supplementation with EDTA will enhance bacterial susceptibility to the antibacterial actions of

human serum. One in vitro study with Acinetobacter baumannii, an opportunistic pathogen that produces severe infections in immunocompromised people (e.g. HIV), looked at 16 clinical isolates of the microbe, resistant to normal human serum. With pretreatment of the isolates using EDTA, 9 were rendered susceptible. Sources for Bi-EDTA: Unfortunately Bi-EDTA is not available commercially. I am including this information on the supplement because it holds great promise in the treatment of Lyme disease.

Combining EDTA and Bismuth: There is the possibility that combining bismuth subsalicylate and EDTA may be somewhat helpful in the treatment of Lyme disease. This approach is extremely experimental and should be approached with caution and only under the supervision of a knowledgeable health practitioner.

Dosages: Ca-EDTA is very safe as is oral bismuth subsalicylate. However in large doses bismuth can be very toxic. In general bismuth is poorly absorbable through the GI tract. The exception is colloidal bismuth subcitrate (CBS). Studies have found that this formulation results in concentrations of bismuth in the blood serum and subsequent accumulation in the kidneys, lung, spleen, liver, brain, and muscle tissue. Ingestion of 120 mg of CBS in five healthy volunteers found that peak blood concentration occurred one hour after ingestion with no detectable bismuth in the blood after four hours. However, with repeated dosing bismuth accumulates in tissues. In nine people taking 480mg of CBS daily it was found that plasma concentrations rose to a steady-state median value of 12 micrograms/L after three weeks and a slow rise to 17 mcg/L after six weeks. In comparison, oral dosing with Pepto-Bismol - a single 30ml dose - produces about a 9.63 nanograms/L. Continual dosing daily raises this to 16.1 nanograms/L after four weeks. A nanogram is one billionth of a gram, a microgram is one millionth of a gram.

Bismuth is a heavy metal and does produce side effects much like that of mercury in the central nervous system. It can cause nervous system disorders, skin irritations, headaches, rashes, and impaired kidney function. Herb/drug interactions: Bismuth absorption is increased by the use of smilax (sarsaparilla). I have been unable to find studies on the rate of increase or how much increase does occur. The use of bismuth with smilax should be approached with caution.

Ingestion of bismuth containing anti-acids will inactivate cat's claw if both are taken at the same time.

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