Chinese Herbal Medicine and Thyroid Disorders

"Thyroid disease is common in China, and it is frequently treated by herbal medicine or a combination of herbs and drugs," according to Subhuti Dharmananda, PhD, Director, Institute for Traditional Medicine (Portland, Oregon). Forty-two percent of 700-plus patients with hyperthyroidism (from over a dozen studies) were "cured" with the aid of Chinese herbal medicine. These patients reported total relief of symptoms, and their T3 and T4 levels and iodine uptake were in normal range. Symptoms for most of the remaining patients stayed "well-managed even after cessation of the therapy." In addition, two studies showed a reduction in circulating antibodies to thyroid tissue. Dr. Dharmananda says that hyperthyroidism attracts more attention than hypothyroidism in Chinese research because of disturbing symptoms like irregular heartbeat. The symptoms of hypothyroidism (i.e., fatigue, lethargy, weight gain, and cold intolerance) correspond to qi and yang deficiency and are treated accordingly.

In his review of clinical studies, Dr. Dharmananda found "a clear pattern of herb selection" for hyperthyroidism. Heart palpitation, excessive perspiration, general hyperactivity, and other hyperthyroid symptoms are signs of yin deficiency. Consequently, yin nourishing and/or fire-purging herbs, such as raw rehmannia and scrophularia, are common ingredients in Chinese herbal formulas for hyperthyroidism. In cases with thyroid nodules or swelling, phlegm-resolving components, such as fritillaria and oyster shell, are added. Most patients gain symptomatic relief within 30 to 90 days of starting their herbal formula.

The inclusion of sea-derived ingredients, particularly iodine-containing seaweed, is controversial in the treatment of thyroid conditions. In his review, Dharmananda noted that oyster shell was used in 12 of 18 clinical trials using a basic formula. "Oyster shell and other shells not only resolve masses, but also help to calm liver wind, thought to be responsible for some hyperthyroid symptoms," he explains. Also, sea materials, particularly seaweeds, have a long history of traditional use and would be particularly helpful in treating goiter, caused by iodine deficiency. However, we now have stresses, environmental toxins, and processed foods that were unheard of in earlier times, making thyroid dysfunction etiology more complicated.

I found a few case reports in medical literature about iodine-induced thyrotoxicosis in people consuming kelp tablets or kelp-containing tea. B. Clair Eliason, MD, reports that four case reports of people developing hyperthyroidism while taking kelp were published in a 31-year MEDLINE search (1966 through 1997). Kelp, by far, has the highest iodine content of six common seaweeds, according to a 2006 Journal of General Internal Medicine article. Kelp/kombu iodine content measures 2650 micrograms/gram in one study and 1542 μg/g in another. In contrast, nori’s iodine content is 43 μg/g and 16 μg/g;ulse’s is 44 μg/g and 72 μg/g; and wakame’s is 161 μg/g and 66 μg/g. A 1994 Japanese study that compares the incidence of thyroid dysfunction in 1061 coastal residents to the incidence found in 4110 inland residents concludes: "...[thyroid autoantibody negative hypothyroidism] is more prevalent and marked in subjects consuming further excess amounts of iodine and...excessive intake of iodine should be considered an etiology of hypothyroidism in addition to chronic thyroiditis in these areas."

As Dr. Dharmananda points out, Chinese studies have shown success without the use of seaweeds. "The continued use of surgical thyroidectomy and iodine-irradiation of the thyroid gland to remove thyroid activity in hyperthyroid patients," says Dr. Dharmananda, "may be deemed a last resort rather than a standard method of therapy if Chinese medicine is incorporated into the health care system. This can reduce the health problems encountered by Grave’s disease patients and also reduce the cost of lifelong health care."


Endocrine-Disrupting Chemicals and Thyroid Function

A European Union research program, called EURISKED, is analyzing the multi-organ effects of several suspected endocrine-disrupting chemicals (EDCs). Until recently, researchers have evaluated a chemical’s health risk according to its ability to cause birth defects, cancer, or reproductive defects. Now, researchers are looking at effects on endocrine glands, including the thyroid.

Some endocrine-disrupting chemicals (EDCs), such as polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers, structurally resemble thyroid hormones, which may explain why these chemicals disturb thyroid function and structure. EURISKED is evaluating several chemicals including isoflavones from soybeans, resveratrol from grapes, silymarin from milk thistle, and xanthohomol from hops.

In a report of its first results, the researchers said that EDC interference of the hypothalamus-pituitary-thyroid (HPT) axis often does not follow the “classic textbook” understanding of endocrine regulation and feedback: “...lower T4 was not always accompanied by higher TSH, for example...[and T3-sensitive enzyme activity] did not always correlate with concentrations of circulating thyroid hormone levels.” The researchers believe that some EDCs may affect more than one part of the HPT axis or may even affect more than one endocrine axis. Because these chemicals do not follow textbook rules, the EURISKED researchers call for new screening and assessment protocols to evaluate endocrine activity and EDCs’ long-reaching effects. EDCs cause epigenetic modification, meaning their effects can be carried into future generations, according to a 2005 study in Science by M.D. Anway and colleagues. Looking solely at TSH, T4, T3, and thyroid weight and morphology does not track the complex actions of EDCs.

The EURISKED researchers believe that an adequate supply of iodine can help the thyroid gland cope with EDC exposure. Iodine dosage and supplementation, however, are subjects of ongoing debate. The traditional view is that 150 micrograms/day is “appropriate and necessary” and over 1000 micrograms (one milligram) is “potentially toxic,” according to the Iodine Group (www.iodine4health.com). This group’s website is dedicated to examining the physiological effects and need for iodine. The Iodine Group has monitored an ongoing discussion between those promoting a cautious use of iodine supplementation and those who support the orthiodosupplementation view. According to orthiodosupplementation, most people need 6.5 to 12.5 milligrams of iodine per day to retain health. The Iodine Group refers people to Townsend Letter (www.townsendletter.com) for the debate between Alan Gaby, Guy E. Abraham, and David Brownstein about iodine supplementation.

Neuroendocrine System and Hair Mineral Analysis Patterns

A 1994 article by Richard Malter, PhD, and a 2003 article by Lawrence Wilson, MD, explain how levels and, particularly, ratios between calcium, magnesium, sodium, potassium, and phosphorus in hair samples can provide abundant information about a person’s neuroendocrine system. Dr. Malter’s article uses trace mineral patterns, identified by Dr. David Watts, Research Director of Trace Elements Inc., to assess endocrine action and corresponding mental-emotional states. Sodium/magnesium ratios, for example, reflect adrenal activity. “With the activation of the stress response,” Dr. Malter explains, “the adrenal glands increase their secretion of the hormone aldosterone, which increases the retention of sodium in the cells and tissues.” As some mineral levels rise, others fall. As sodium retention increases during stress, magnesium levels decline. Dr. Malter explains how patterns of ratios between trace minerals correspond to psychological-emotional states, including alcoholism, addictions, trauma, abuse, anger/panic disorders, exhaustion, and hyperactivity. Being a person who enjoys patterns, I found Dr. Malter’s article fascinating.

Lawrence Wilson, MD, uses a hair mineral analysis system developed by Dr. Paul C. Eck to assess stress and oxidation type. Dr. Eck founded Analytical Research Laboratories in 1975. Dr. Eck synthesized Dr. Hans Selye’s stages of stress, Dr. George Watson’s oxidation types, the parasympathetic and sympathetic concepts of Dr. Melvin Page, Dr. William Albrecht’s mineral wheel, and the use of hair mineral analysis into a clear method for evaluating endocrine function. The Eck-Wilson model uses sodium/potassium and sodium/magnesium ratios in hair tissue to assess adrenal function. Dr. Wilson also considers the effect of potentially toxic metal levels. For example, high levels of manganese, copper, iron, chromium, and selenium can artificially elevate sodium levels in hair tissue. Dr. Wilson has several articles on the use of trace mineral hair analysis, adrenal function, thyroid function, sympathetic vs. parasympathetic function, the interference caused by toxic metals, and nutritional balancing at his website, www.drlwilson.com.

Hair mineral analysis has a reputation for being unreliable. That perception may discourage practitioners from investigating the use of trace mineral ratios to evaluate endocrine balance and the effect of stress. A 2001 JAMA study by Sharon Seidel, PhD, and colleagues told health practitioners to “refrain from using such analyses to assess individual nutritional status or suspected environmental exposures.” The Seidel assessment met with considerable criticism from hair analysis laboratories for its small size (hair from only one person was used) and its comparison of six laboratories that use different ways to prepare hair samples. Solvents and detergents used at many laboratories, according to Dr. Wilson, remove electrolytes and trace minerals—particularly sodium and potassium, two of the...
main electrolytes used to evaluate terrain and endocrine function. Dr. Wilson says, "Readings [in the Seidel study] from the two labs that did not wash the hair were identical for six of nine elements tested and extremely close for all others."


Adaptogenic Herbs

"Adaptogens are an ideal choice for people with symptoms of chronic stress, as an adjunctive treatment for any endocrine condition or immune disorder and as a general daily tonic," writes Michael Friedman, ND, author of the text Fundamentals of Naturopathic Endocrinology. Adaptogenic herbs help the body adapt to stress. They balance adrenal function, slowing overactive glands (and decreasing hormone excretion) and boosting underactive glands. The health and balance of the rest of the endocrine system, as well as the immune system, depend upon how well the adrenals function. Dr. Friedman profiles several adaptogenic herbs including Ashwagandha (Withania somnifera), Licorice (Glycyrrhiza glabra), Siberian Ginseng (Eleutherococcus senticosus), Golden Root (Rhodiola rosea), North American Ginseng (Panax quinquefolius), and Astragalus (Astragalus membranaceus) in this text.

Although each adaptogen helps balance adrenal function, these botanicals are not interchangeable. Each has specific qualities. Ashwagandha, for example, is used to treat sexual debility, memory loss, and other signs of aging in addition to signs of adrenal fatigue such as fatigue, debility, and nervous exhaustion. Licorice increases cortisol levels and raises blood pressure. (Consequently, people who are taking corticosteroids or have a history of high blood pressure need to exercise caution when using licorice.) Siberian ginseng is commonly used for exhaustion and depression. Rhodiola is another adaptogen that relieves depression; it is also a recognized immune system stimulant. North American ginseng, "a gentle tonic to be used over a long period of time," relieves nervous dyspepsia and nervous exhaustion from overwork. Astragalus, an adaptogen used in Chinese medicine, also promotes lung and spleen function.

In addition to choosing adaptogens according to their specific actions, Dr. Friedman discusses other considerations when prescribing these herbs. Unlike some medicinals, adaptogens are usually prescribed for an extended period. Consequently, adaptogens must be readily available, affordable, and in a form that the person will agree to take over a long period. Some people prefer capsules, especially if the tincture tastes extremely bitter. Others may prefer a pleasant-tasting tea made from dried herbs. Educating the patient about the long-term benefits of adaptogens also helps compliance. "Adaptogens can protect us from and strengthen us after serious illness," Dr. Friedman writes. "These herbs can help to optimize our physical and mental potential. They as the rest of the plant community are a great gift to be appreciated and used respectfully."


Dehydroepiandrosterone Enhancement

Dehydroepiandrosterone (DHEA) is the adrenal cortex's most abundant product. This steroid hormone converts into other hormones, such as androgens and estrogens. As a result, DHEA is necessary in order for a huge range of metabolic and endocrine functions to take place. "For many years, scientists assumed that DHEA merely functioned as a reservoir upon which the body could draw to produce other hormones, such as estrogen and testosterone," writes Alan Gaby, MD in a 1996 article. "However, the recent identification of DHEA receptors in the liver, kidney, and testes of rats strongly suggests that DHEA may have specific physiologic actions of its own." Increased longevity and decreased risk of heart disease and cancer are among the benefits associated with higher DHEA levels, according to epidemiological studies. DHEA production begins to decrease around age 25.

Some people with adrenal insufficiency and/or thyroid insufficiency benefit from DHEA supplementation, but supplementation requires professional monitoring. Dr. Gaby has had to lower some patients' thyroid hormone dosage after they started taking DHEA. These patients developed signs of thyrotoxicosis, possibly because DHEA boosts thyroid hormone activity. Dr. Gaby says that "patients [report] that they felt better on DHEA plus lower-dose thyroid hormone than they did on thyroid hormone alone." Neither the long-term effects of DHEA nor its actual physiologic replacement dose are known. Consequently, Dr. Gaby urges people to "use this hormone with care and err on the side of caution." Dr. Gaby usually prescribes 5-15 mg per day for women and 10-30 mg per day for men, taken in capsules twice a day. Even though this is considerably less than the 50-100 mg/day that some doctors prescribe, Dr. Gaby has seen a response even in a patient with severe adrenal insufficiency. Dr. Gaby says that patients who do not respond at the lower dose range usually do not respond at a higher dose, the sole exception being people with lupus or other autoimmune diseases.

In Health & Longevity, a 2007 conference presentation produced by The Message Company, Norm Shealy, MD, says that he does not recommend DHEA supplementation at all because it inhibits a normal DHEA/cortisol ratio. Instead, he recommends using one to four natural DHEA enhancers: joy, sex, sunshine, meditation ("15 minutes of sensing your
angel wrapping its wings around you”), a combination of four nutrients (“youth formula”), transdermal magnesium, natural progesterone cream, and a series of 12 acupuncture points that he calls “Ring of Fire.” His “youth formula” consists of MSM (one gram), beta-glucan (six mg), vitamin C (two g), and molybdenum (60 micrograms). Readily absorbable magnesium lotion can also boost DHEA levels on its own. Dr. Shealy considers DHEA to be the chemical equivalent of “qi.” He and colleagues hold a 1997 US patent on enhancing DHEA with natural progesterone and electrical stimulation of “the Ring of Fire.”


Wilson’s Temperature Syndrome

Wilson’s Temperature Syndrome (WTS) is a condition in which a person has normal thyroid stimulating hormone (TSH) and thyroxine (T4) levels but experiences low body temperature and at least one symptom associated with hypothyroidism. WTS symptoms include persistent or relapsing fatigue, muscle aches, insomnia, cognitive dysfunction, and overall lack of well-being. Denis Wilson, MD, who defined this syndrome, believes that symptoms result from a persistent and maladaptive problem with T4 to T3 conversion in the body’s tissues. (T3 is the active thyroid hormone used by mitochondria.) Dr. Wilson uses sustained-release triiodothyronine (T3), taken every 12 hours, to re-calibrate metabolism and body temperature patterns.

Sustained-release T3 therapy requires careful monitoring of body temperature to make changes in dosage as the body adapts. “[T]he first cycle SR-T3 may require 90 mcg of T3 b.i.d. to obtain a normal temperature,” Michael Friedman, ND, explains, “while the second cycle may require only 45 mcg of T3 to achieve the same temperature.” Some patients continue to experience symptoms during treatment or develop new ones, such as heart palpitations, increased heart rate, irritability, shakiness, or headaches. In such cases a small dose (.0125-.025 mg) of Levothyroxine (T4) is added to compete with the T3 and lessen its effects. Dr. Friedman says, “...administration of T4 usually decreases or eliminates the side effects of T3 therapy within 45 minutes.” When body temperature stabilizes near 98.6°F and symptoms improve or resolve, the patient is gradually weaned off SR-T3 therapy. Usually patients experience no return of symptoms, but, if they do, “a very short cycle of SR-T3 will bring them back to normal.” Information about Wilson’s temperature syndrome is available at www.WTSmed.com.

The results of at least two studies support the therapeutic value of T3 therapy. A 1999 study by Lithuania endocrinologists showed: “Patients with hypothyroidism benefited when 12.5 μg of triiodothyronine was substituted for 50 μg of thyroxine in their treatment regimens. They performed better on standard neuropsychological tasks, and their psychological state improved.” A 2006 study involving 11 patients with chronic fatigue syndrome found that basal temperature in all patients increased after WTS therapy. In addition, each patient experienced improvement in the five symptoms measured. Recovery time ranged from three weeks to 12 months.


Noise Stress and the Adrenals

Last summer, I visited family in rural Ohio. As I sat on the porch, I suddenly became aware of... quiet. In that moment, I felt chronically held tension seep from my body. We take common noises in industrialized society – the hum and buzz of appliances, the whoosh of road traffic – for granted, but our neuroendocrine systems do not.

Most of us recognize that surge of adrenaline that occurs even during sleep. “It’s quick and overshooting excitations caused by noise signals are subcorticallv connected via the amygdala to the hypothalamic-pituitary-adrenal axis (HPA-axis),” M. Spreng, a German researcher, explains. “Thus, noise causes the release of different stress hormones (e.g., corticotropin-releasing hormone [CRH]; adrenocorticotropic hormone [ACTH]), especially in sleeping persons during the vagotropic night/early morning phase. These effects occur below the waking threshold of noise and are mainly without mental control.”

Studies conducted as early as 1961 show that all types of sounds, including some music, produce biochemical signs of stress. Industrial noise, generated broadband noises (e.g., white or pink...
noise), tonal sounds, road traffic, and jet engines primarily increase catecholamine levels, such as norepinephrine, and corticosteroids, such as cortisol. (Norepinephrine induces vasconstriction and raises blood pressure.) Low-frequency noise actually decreases corticosteroid levels, but it increases adrenaline. Stress research indicates that becoming used to a sound or other stressor reduces its acute effects. Over time, sounds that remain relatively constant produce less effect than intermittent noise. But long-term exposure to a stress— even a familiar stress— can have physiological consequences. "The effects of longer-lasting activation of the HPA-axis, especially long-term increase of DNA damage in the adrenal gland," Spreng writes, "are manifold: immune suppression (e.g., eosinopenia), insulin resistance (e.g., diabetes), cardiovascular diseases (e.g., hypertension and arteriosclerosis), and catabolism (e.g., osteoporosis), intestinal problems (e.g., stress ulcer), etc."

In addition to affecting the HPA-axis, noise stress changes cellular structure and damages DNA, according to animal studies. In December 2004, Italian researchers reported that exposure to 100 decibel sound for 12 hours caused a significant increase of DNA damage in the adrenal gland of rats. A chain saw, speeding express train, farm tractor, or jackhammer produces a 100-decibel noise level. DNA migration (unrelated to cell death) was still occurring in the rats' adrenals 24 hours after the noise stopped. The US Occupational Safety and Health Administration limits workers' exposure to 90-decibel sound (e.g., heavy traffic, average volume on Walkman earphone) to eight hours per day. Exposure to 100-decibel noise should last no longer than two hours.


Low Thyroid and Adrenal Function

Many chronically ill patients have both low adrenal function and low thyroid function. In such cases, Michaël Friedman, ND, recommends supporting the adrenal glands before raising thyroid hormone levels; "...otherwise, increased circulating thyroid hormone may further strain the already weak adrenal glands." Adrenal support includes a whole foods, natural diet that avoids blood sugar dives and surges as well as stimulants (e.g., caffeine). Other methods for boosting adrenal function include nutritional supplements (particularly vitamins A, C, E, pantothenic acid, manganese, and zinc), adaptogenic herbs, adrenal glandular products, and, if necessary, adrenal hormone supplementation. Dr. Lawrence Wilson also recommends stress reduction techniques, infrared sauna therapy, and supplements that promote toxic metal elimination.

With the current emphasis on hypothyroidism, adrenal insufficiency is often ignored, especially by conventional practitioners. Adrenal function can be assessed via saliva and urinary cortisol testings, but symptoms, in themselves, are often reliable indicators of insufficiency. Dr. Wilson says, "Anyone who is tired, allergic, intolerant to cold, with symptoms of low blood sugar, weakness, and low blood pressure, most likely has some degree of adrenal insufficiency."

Fatigue and cold intolerance are also signs of hypothyroidism. Usually, hypothyroidism is diagnosed with standard tests, beginning with the pituitary gland's production of thyroid stimulating hormone (TSH). Abnormal TSH results lead to further testing of T4 and T3 levels. The thyroid produces T4 using tyrosine, manganese, iodine, and other micronutrients. Dr. Wilson says, "Radiation toxicity, excessive oxidant stress or toxic chemicals can block hormone synthesis. Mercury and copper toxicity stimulate hormone synthesis." T3 is a more potent thyroid hormone used by mitochondria. Fatigue, lethargy, above normal TSH, and low T3 and T4 levels are the common signs of hypothyroid disorders. Heart palpitations, weight loss, and below normal TSH are common signs of hyperthyroidism.

Unfortunately, the definition of normal TSH has changed in the past few years. In late 2002 and early 2003, both the National Academy of Clinical Biochemistry (NACB) and the American Association of Clinical Endocrinologists (AAACE) defined normal TSH as 0.3 to 3.0. NACB expects "the upper limit of the...reference range will be reduced to 2.5 mIU/L because >95% of rigorously screened normal euthyroid volunteers have serum TSH values between 0.4 and 2.5 mIU/L." Mary Shomon explains that these experts re-evaluated the original reference range of 0.5 to 5.0 when they realized that some people in the cohort used to define "normal" actually had mild thyroid disease; "...their higher TSH levels skewed the standard curve." Many laboratories have been slow to accept the new reference range. When a person with hypothyroid symptoms is told that the TSH test is "normal," the next question is which reference range was used to define "normal"?


