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RE: Review of Botanicals Used for Thyroid Function Regulation

Yarnell E, Abascal K. Botanical medicine for thyroid regulation. *Altern & Comp Ther.* June 2006:107-112.

Thyroid disorders incidence is increasing, in part due to environmental pollution and exposure to radiation. "Most authorities agree that the annual incidence of hyperthyroidism in the West is 1 in 1000 women or 10,000 men; the incidence of hypothyroidism is at least ten times as great." The authors discuss several herbal remedies which may provide treatment options for thyroid patients. In their practice, they have found such medications, along with treatment of underlying causes, generally effective for symptomatic relief in hyperthyroidism, with greatest efficacy in cases of Graves' address disease. In contrast, herbal treatments for hypothyroidism are "much more variable" in efficacy, and should generally be undertaken only in conjunction with other treatments, often including thyroid hormone replacement.

Some herbs, traditionally used worldwide to treat symptoms rapid pulse, tachycardia, and insomnia, have been found effective in reducing these symptoms when they occur in hyperthyroidism. Bugleweed (*Lycopus virginicus*), European bugleweed (a.k.a. gypsywort; *L. europaeus*), shiny bugleweed (a.k.a. Asian bugleweed; *L. lucidus*) and American bugleweed (a.k.a. American water horehound; *L. americanus*) are thyrosuppressive, as are several other members of the Lamiaceae (mint) family, "suggesting that there is a common set of constituents in the Lamiaceae that have the same activity. The most likely candidates... are various hydroxycinnamic-acid-derived simple plant acids, such as lithospermic, rosmarinic, caffeic, and chlorogenic acids." Bugleweed and European bugleweed have been studied for their thyroid effects in Germany since the 1950s; however, there appear to be no human clinical trials on the efficacy of these herbs or their extracts. Laboratory results indicate that these related herbs are all more or less equally effective, inhibiting binding of the stimulating bodies of Graves' disease to thyroid cells, blocking thyroid-stimulating hormone (TSH), decreasing peripheral T4 deiodinization, and possibly inhibiting iodine metabolism. Bugleweed and related herbs have also been shown to decrease prolactin levels and to inhibit both luteinizing hormone (LH) and follicle-stimulating hormone (FSH), and to enhance efficacy of some antibiotics against drug-resistant bacteria in vitro. Recent Asian

studies of shiny bugleweed show that it has antioxidant properties, decreases blood viscosity, and has anti-allergenic effects.

Other Lamiaceae mentioned are lemon balm (*Melissa officinalis*), rosemary (*Rosmarinus officinalis*), and sage (*Salvia officinalis*). There are many similarities between lemon balm and bugleweed: both have historically been used to calm the heart, and both inhibit binding of TSH to thyroid follicles, block peripheral T4 deiodinization, and block stimulating autoantibodies of Graves' disease. Lemon balm, rosemary, and sage's nonthyroid actions are quite similar; all are antivirals, antioxidants, nervines and spasmolytics, containing both hydroxycinnamic-acid derivatives and low-molecular weight terpenoids. The German Commission E approves lemon balm for nervous sleeping disorders. While lemon balm has no history of use for hyperthyroidism, "clinicians are increasingly including [it] as a component of herbal [thyroid] formulas." And, "[w]hile neither rosemary nor sage is considered thyrosuppressive, it is entirely possible they both may have such activities and should be investigated for this. The same holds true for other members of the [Lamiaceae] with similar constituent profiles." Yarnell and Abascal mention that clinical experience suggests that lemon balm, like the various *Lycopus* species mentioned, "will only inhibit an overactive thyroid and not one that is functioning normally." However, while there is "no suggestion" that lemon balm should be avoided by hypothyroid patients, they advise that bugleweed should not be taken by anyone who has hypothyroid or during pregnancy; it is unclear what prompts the different levels of caution for the two herbs.

Two herbs with actions similar to, but stronger than, bugleweed's are American gromwell (*Lithospermum ruderale*) and European gromwell (*Lithospermum officinale*). Members of the Boraginaceae family may contain naphthoquinone compounds and unsaturated pyrrolizidine alkaloids (PAs) in addition to hydroxycinnamic-acid derivatives. Gromwell's effects are basically the same as bugleweed's (blocking TSH binding, inhibiting iodine transport to thyroid follicles, decreasing peripheral T3 deiodinization, and blocking LH and FSH secretion ("with minimal-to-no effects on direct binding of estrogen, progesterone, or testosterone"). However, gromwell's greater potency also raises concerns. In order to minimize risk, a low-ethanol tincture with an acidic menstruum may be employed, with the typical dose 1-2 mL 3 times daily for an average adult. "This herb should definitely not be used during lactation or pregnancy."

A related Chinese herb, red-root lithospermum or zicao (*Lithospermum erythrhizon*) root, also contains naphthoquinones, "most notably a compound dubbed shikonin", which has been shown to inhibit human immunodeficiency virus (HIV), suppress angiogenesis, inhibit *Helicobacter pylori* bacteria and decrease its resistance to antibiotics, and to induce apoptosis (programmed cell death) in cancer cells, among other effects.

Bladderwrack (*Fucus vesiculosus*) has historically been used to regulate and protect the thyroid, whether hyperactive, normal, or underactive. However, there is little information about this seaweed's actual effects. All seaweeds contain "substantial but variable quantities of iodine", which exerts complex effects on the thyroid. While Yarnell and Abascal do not discuss these effects in depth, Figure 1, *Iodine and the thyroid*, illustrates the widely varying effects of iodine supplementation, which may help some people with hypothyroidism as well

as others with hyperthyroidism. The German Commission E warns that consuming more than 150 mcg of iodine daily from bladderwrack may induce or worsen hyperthyroidism. Total daily iodine intake should generally not exceed 1000 mcg. A condition called Hashimoto's thyroiditis is common in Japan, where seaweed consumption, and thus dietary iodine intake, is high; however, researchers disagree as to its cause. "The bottom line is that the true effects of bladderwrack on... thyroid conditions are unknown, but low levels of supplementation are probably safe in most patients."

While there is "boundless enthusiasm on the Internet" about herbs for hypothyroidism, the authors are less convinced. There is little evidence documenting beneficial effects of any herb for this condition, except for a few open clinical trials in China, conducted on a variety of herbal formulas for what is called, in Traditional Chinese Medicine, kidney *yang* deficiency (hypothyroidism in Western medicine). Some benefits have been shown in these studies. However, based on limited evidence, there are several herbs Abascal and Yarnell say may hold promise for hypothyroidism. Among these are ashwaganda (*Withania somnifera*); gotu kola (*Centella asiatica*) leaf; bauhinia (*Bauhinia purpurea*) bark, coleus or forskohlii (*Plectranthus barbatus*, syn. *Coleus forskohlii*), and guggul (*Commiphora mukul*).

A few animal studies, as well as one Dutch case report of a woman who developed thyrotoxicosis while taking ashwaganda capsules, support the theory that this herb can stimulate thyroid function. Guggul gum resin countered drug-induced hypothyroidism in mice, but a human case series found no effect on thyroid function in obese patients who took 750 mg of guggulsterone daily. Since coleus stimulates adenylate cyclase, "there is a theoretical argument that it is capable of mimicking the effects of TSH, which also activates adenylate cyclase when binding to the TSH receptor. "In vitro, the compound forskolin... increased T4 synthesis by thyroid follicles. No clinical data could be located." Bauhinia increased both T3 and T4 levels in one animal study, alone or combined with ashwaganda and guggul. Gotu kola, while commonly recommended for hypothyroidism, lacks supporting data. It is said by one prominent herbalist to stimulate T4 synthesis, but the authors have "not found it to have remarkable clinical effects" in their practice. A paucity of actual data on these herbs' thyroid effects, the very large number of people who have hypothyroidism, and the apparently unrestrained Internet trade in remedies for the condition present a strong argument for the urgent need of research in this area.

In a sidebar, a multi-herb formula for hyperthyroidism, developed by the late Silena Heron, N.D., Dr. Yarnell's mentor, is detailed. Several clinicians have used it and reported it as efficacious and as having no deleterious side effects despite long-term use. Dr. Heron's ThyroNix formula includes, in addition to tinctures of gromwell, bladderwrack, bugleweed, and lemon balm, motherwort (*Leonurus cardiaca*), watercress (*Rorippa nasturtium-aquaticum*), mullein (*Verbascum thapsus*) leaf, and horseradish (*Armoracia rusticana*).

— Mariann Garner-Wizard

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