

### **Remarkable study comparing Armour Thyroid and levothyroxine**

Several studies have shown that many patients with hypothyroidism on levothyroxine replacement have low quality-of-life. An alternative to levothyroxine replacement for patients with hypothyroidism is desiccated thyroid that comes from pig thyroid, of which the most common brand is Armour Thyroid. Armour Thyroid has been in use for almost 100 years (since the 1920s) although it went out-of-favor about 25 years ago with more doctors prescribing synthetic levothyroxine. However recently there has been an added interest in using Armour Thyroid and other formulations of desiccated thyroid, partly because of the low quality-of-life some patients have on levothyroxine replacement and partly because of an interest in patients to use something they consider “more natural” and less synthetic. Most endocrinologists and consensus guidelines by the American Thyroid Association still recommend the use of synthetic levothyroxine and to avoid desiccated thyroid, in part due to the erroneous belief that desiccated thyroid is not standardized. .

In the May 2013 issue of *Journal of Clinical Endocrinology and Metabolism* <http://www.ncbi.nlm.nih.gov/pubmed/23539727>, Huang and colleagues from the Walter Reed Medical National Military Medical Center in Bethesda, Maryland published the results of a randomized crossover study in which 70 patients completed the study and received either desiccated thyroid or levothyroxine replacement. In the introduction to this paper they commented that the T4 and T3 content of desiccated thyroid preparations, especially Armour Thyroid, has now been standardized. They cited a paper by JC Lowe published in the journal *Thyroid Science* in 2009 states that it is that Armour Thyroid has indeed been standardized so that 1 grain of Armour Thyroid contains 38 µg of L-T4 and 9 µg of liothyronine (T3).

The 2013 study by Huang and colleagues used to a conversion factor that 1 mg of Armour Thyroid was equivalent to 1.67 µg of levothyroxine to determine equivalent dosing between the two preparations. Patients were on a stable dose of levothyroxine and had a normal TSH before the study started. Half of them were then initially given Armour Thyroid and half of them continued on the levothyroxine. 78 patients were randomized and 70 concluding the study, with 35 received Armour Thyroid at the beginning and 35 received levothyroxine at the beginning. The dose of either the levothyroxine or the Armour Thyroid was adjusted after six weeks so that the TSH was between 0.5 and 3.0. They continued on that dose for an additional 10 weeks. After 16 weeks, patients were switched over to the other compound with the same adjustment at 6 weeks and continued for another 10 weeks.

At the beginning of the study and at the end of each 16 weeks session, the patient underwent thyroid function test, biochemical testing, memory testing (the Wechsler memory scale), a depression inventory, and a thyroid symptom questionnaire. They compare the results before and after treatment for each group. There was not a statistical improvement in symptoms for general health questionnaires or neuropsychological testing, however there was a trend toward improvement in these tests for the group that took the desiccated thyroid compared to the levothyroxine replacement group. There was a 2.86 pound weight loss among the group that took the desiccated thyroid compared to the levothyroxine group that was significant. Patients on Armour Thyroid did get a slightly lower HDL level that is the good cholesterol, so that could be a potential detriment to Armour replacement.

TSH was slightly higher in the group on Armour Thyroid than in the group on levothyroxine, so possibly if the dose of Armour Thyroid was a little bit higher (the authors recommended 1 mg of Armour Thyroid = 1.47 µg of levothyroxine), the TSH would have been lower and more improvement might have been seen with the Armour Thyroid. Both total T4 and free T4 were much lower on the Armour Thyroid than on levothyroxine replacement indicating that patients

on Armour Thyroid need an additional low dose of levothyroxine, as Dr. Friedman often prescribes. Total T3 went up on Armour Thyroid as expected. Baseline (on stable levothyroxine replacement) reverse T3 (a test used by many functional medicine doctors and other non-Endocrinologists to track poor T4 to T3 conversion) was above the range in many of the patients suggesting that levothyroxine replacement increases reverse T3 and did go down with the Armour Thyroid compared to the levothyroxine replacement. This suggests that levothyroxine raises reverse T3 and Armour Thyroid lowers it, but doesn't conclude that patients with an elevated reverse T3, either on no treatment or on levothyroxine replacement need to go on desiccated thyroid.

Most importantly, 49% of the patients preferred Armour Thyroid, 19% preferably levothyroxine and 33% did not notice a difference. This was important as the study was blinded and they didn't know which thyroid preparation they were taking and indicates some subtle improvement in how they were feeling with Armour Thyroid. The subgroup that preferred Armour Thyroid lost even more weight; they lost 4 pounds on Armour Thyroid compared to levothyroxine. They had better well-being and their thyroid symptoms were significantly better with better cognitive function on Armour Thyroid compared to when they were on levothyroxine. This suggests that a subset of patients need Armour Thyroid as opposed to levothyroxine alone. These patients may be poor converters of T4 to T3.

There were no side effects in the Armour Thyroid group; specifically there was no increase in heart rate or pulse.

The authors concluded that improvement with Armour Thyroid may not be detected by the relatively insensitive methods used in the study. They also concluded that once-daily desiccated thyroid in place of levothyroxine caused modest weight loss and possible improvements in symptoms and mental health without appreciable adverse effects. They recommended studies with a longer duration to clarify the efficacy and safety of desiccated thyroid.

Dr. Friedman has several comments on this paper. First he found it to be a very well designed and well executed study done by a reputable group and published in a superb journal. He notes that the Armour Thyroid was given as a single dose once a day without levothyroxine. Since Armour Thyroid contains T3 that has a short half-life, Dr. Friedman prescribes Armour Thyroid twice a day with additional levothyroxine. He suspects that if the study gave Armour Thyroid twice a day plus levothyroxine supplementation those patients would have done even better than on once a day Armour Thyroid. This study clearly refuted that Armour Thyroid is inferior to levothyroxine.

The study also pointed out the importance of trying to determine the subset of patients to put on desiccated thyroid. A significant subset of patients did prefer the desiccated thyroid. Those who preferred desiccated thyroid were more likely to have autoimmune thyroid disease and had a slightly higher reverse T3, although neither of these were significant. The study examined all patients with hypothyroidism on levothyroxine replacement, most of whom were doing well. If the study used the subset of patients who were on levothyroxine replacement and feeling poor, Dr. Friedman surmises that they would have done even better on desiccated thyroid. Many of the patients who come to see Dr. Friedman have a low quality-of-life on levothyroxine replacement. If your doctor refuses to prescribe desiccated thyroid, show him the 2013 article or better yet, come out and see Dr. Friedman.

For more information about Dr. Friedman's practice or to schedule an appointment, go to [www.goodhormonehealth.com](http://www.goodhormonehealth.com) or email us at [mail@goodhormonehealth.com](mailto:mail@goodhormonehealth.com).