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Is Levothyroxine (T4) the Only Answer?

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Some of the best selling drugs in the United States are Synthroid®, Levothroid®, Levoxyl® and generic levothyroxine, or T4, as this thyroid hormone is sometimes called. This is an indication, at least in part, of a significant prevalence of hypothyroidism or low thyroid function. However, many people—including some practitioners—are now questioning the effectiveness of this hormone in treating hypothyroidism.

Practitioners typically order a thyroid stimulating hormone or TSH test when presented with a patient who is displaying signs of low thyroid activity (see Hypothyroidism: Is 98.6° Really Normal?). TSH, which is produced by the pituitary gland, has for the last 25 years been considered the foremost indicator of thyroid activity. If a patient's TSH number is high, it is assumed that the pituitary is working overtime to try to stimulate the thyroid to produce more hormones. So the practitioner prescribes the thyroid hormone T4 and the TSH number comes down. It's that simple: when a hormone cannot be produced, a replacement dose fixes the problem.

Yet, for many patients, T4 does not fix the problem. This treatment approach doesn't address the needs of those who still suffer with hypothyroid symptoms, even when their TSH blood levels look perfect. In these cases, practitioners might add a free T4 test (free meaning that the T4 thyroid hormone is not on a carrier protein and is therefore able to enter a cell), along with the TSH test, to help monitor the level of T4 available in the blood.

One of the underlying assumptions with this theory is that the serum levels of thyroid hormones reflect the thyroid levels in the tissue cells, assuming that the thyroid hormones somehow drift into or are absorbed by the cell. But this assumption is now under scrutiny.

Dr. Kent Holtorf, medical director of the National Academy of Hypothyroidism, points out that tissue hormone levels can be very low, even when blood levels

are not (as backed by numerous scientific studies). He suggests that some patients might have a problem with the proper transport of thyroid hormones into the cells.

Proper thyroid function requires that both the T3 (triiodothyronine) and T4 hormones get inside tissue cells, with T3 requiring much less energy for cell transport than T4. Numerous studies demonstrate that, under some conditions, the cell energy is simply not sufficient to allow for adequate thyroid hormone transport. These conditions include but are not limited to metabolic syndrome, insulin resistance, diabetes, chronic and acute dieting, chronic fatigue, migraines, depression, anxiety, bipolar syndrome, chronic infections, chronic inflammation, high triglycerides and high cholesterol. Additionally, the use of some drugs, such as Valium®, Ativan® and Xanax® can interfere with T3's ability to enter into the cells.

Another potential issue with thyroid hormone effectiveness is a rarely measured hormone called reverse T3 (RT3), which can fit into hormone receptor sites but, rather than producing thyroid activity, RT3 blocks it. To make the problem even worse, if RT3 levels are high, it actively competes with the T4 transport into the cell. High levels of RT3, as compared to free T3 in the blood, indicate that the formation of active T3 from T4 is being diverted to favor RT3.

The bottom line, according to Dr. Holtorf, is that as long as there is a problem with cellular transport, hypothyroidism cannot be remedied by the administration of T4—only T3 will be able to get into tissue cells and be effective. T3 is available as Cytomel® and as compounded preparations.

Reference

National Academy of Hypothyroidism, www.nahypothyroidism.org

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