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HYPOTHYROIDISM

Obese patients with hypothyroidism may require adjustments of levothyroxine after bariatric surgery

BACKGROUND

Obesity and primary hypothyroidism are common conditions. The adequate treatment of hypothyroidism depends on the adequate administration of thyroid hormone, mainly levothyroxine. Measurement of the TSH level is used to determine whether patients are receiving the right amount of medicine to replace thyroid hormones. Obese patients usually need higher dose of levothyroxine. The absorption of levothyroxine may be affected by some medications and the diet. Conditions affecting the intestines and stomach can also affect the absorption of levothyroxine. With the increase in severely obese patient, surgeries aiming to cause weight loss (bariatric surgery) have been used more frequently over time. One of the ways that bariatric surgery works is by disrupting the absorption of food. This can also lead to problems in absorbing other substances, including thyroid hormone pills. The goal of this study was to evaluate the dose of levothyroxine needed to keep normal TSH levels in obese patients with hypothyroidism before and after bariatric surgery.

THE FULL ARTICLE TITLE

Fierabracci P et al. Weight loss and variation of levothyroxine requirements in hypothyroid obese patients after bariatric surgery. Thyroid. March 16, 2016 [Epub ahead of print].

SUMMARY OF THE STUDY

A total of 93 patients with obesity and hypothyroidism were studied (90 women and 3 men), with an average age of 48 years. Patients were treated at the Obesity Center of the University of Pisa, in Italy. They had different causes for hypothyroidism: Surgery (21 patients), treatment with radioactive iodine (6 patients) and autoimmune thyroiditis (66 patients). They had three different procedures to lose weight; fifty-four patients had bypass of the stomach (which decreases intake and decreases absorption of some nutrients), 31 patients banding of the stomach (which decreases food intake), and 8 patients had an operation to decrease the size of the stomach by about 70-80%, called sleeve gastrectomy (also to decreases food intake and some digestion of food). Weight and height, blood levels of thyroid hormones, TSH, and leptin (a hormone made in the fat tissue) were measured after stabilizing TSH level before surgery and 28-36 months after the surgery. Body composition (fat vs. lean body mass) was analyzed in 20 patients.

Results of the study showed that the weight of the patients decreased significantly after bariatric surgery. In the whole study group, weight decreased by 34 kg (75 lbs), with significant improvement in body mass index (weight corrected for body size). Leptin levels also decreased significantly. TSH decreased significantly from 1.56 to 0.84 mU/L and no increase in treatment dose was needed in the immediate period following surgery. The daily dose of levothyroxine decreased by 11%, from 130.6 ± 48.5 µg/day to 116.2 ± 38.6 µg/day, however, when corrected for body weight (µg/kg/day) the dose increased by 27%, from 1.1 to 1.4 mcg/kg/day. The interval between surgery and the first dose change was between 8-13 months. The dose of levothyroxine had to be decreased in 50% of the patients. It remained unchanged in 37% of patients and had to be increased in 13% of patients (all with autoimmune thyroid disease). The final dose per weight was not significantly different among the three groups and no differences were observed among the different surgical procedures. The reduction of levothyroxine dose did not correlate with weight loss or the reduction of leptin levels. Also, the levothyroxine dose per kilogram of fat mass was 63% higher, while the levothyroxine dose per kilogram of lean mass did not change, therefore, the authors conclude that the overall decrease of levothyroxine dose after bariatric surgery is due to the decrease in lean mass which occurs after these types of surgeries.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Bariatric surgery does not seem to cause increase requirement of levothyroxine in most patients. Overall, patients may need a decrease of their levothyroxine dose after surgery, following weight loss and lost of lean body mass. Patients with autoimmune hypothyroidism required higher doses of levothyroxine over time, likely because of progression of their disease. Some patients did not need change in levothyroxine dose following surgery. Although there is no need to do preventive changes in dose of treatment, TSH needs to be monitored, in order to allow adequate adjustments in treatment.

— Liuska Pesce, MD

HYPOTHYROIDISM, continued

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ABBREVIATIONS & DEFINITIONS

Obesity: Weight that is higher than what is considered as a healthy weight for a given height is described as overweight or obese. Body Mass Index, or BMI, is used as a screening tool for overweight or obesity. In adults, a BMI > 30 kg/m2 is considered in the obese range

Hypothyroidism: a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

Primary hypothyroidism: the most common cause of hypothyroidism cause by failure of the thyroid grand.

Levothyroxine (T_4): the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tyrosint™ and generic preparations.

Thyroid hormone therapy: patients with hypothyroidism are most often treated with Levothyroxine in order to return their thyroid hormone levels to normal. Replacement therapy means the goal is a TSH in the normal range and is the usual therapy. Suppressive therapy means that the goal is a TSH below the normal range and is used in thyroid cancer patients to prevent growth of any remaining cancer cells.

TSH: Thyroid Stimulating Hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

Autoimmune thyroid disease: a group of disorders that are caused by antibodies that get confused and attack the thyroid. These antibodies can either turn on the thyroid (Graves' disease, hyperthyroidism) or turn it off (Hashimoto's thyroiditis, hypothyroidism).

Bariatric surgery is an operation on the stomach and/or intestines that helps patients with extreme obesity to lose weight. This surgery is an option for people who cannot lose weight by other means or who suffer from serious health problems related to obesity.

Leptin: A hormone made in the fat cells, which goes to the blood and reaches the brain where it sends a message that there is enough energy around

Body Composition: The human body is composed of fat mass, muscle mass (lean body mass) and bone mass. Total body water is included in the measurements of muscle mass.