

Obesity-related thyroid function alteration and the Impact of bariatric surgery

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ABSTRACT

Hypothyroidism is the most prevalent endocrine condition in obesity, and subsequent endocrine abnormalities, such as impaired thyroid function, are widespread. It is uncertain if decreased thyroid function is a cause or a result of obesity; also, there is no clear evidence on the optimum approach to dose levothyroxine for people with both hypothyroidism and obesity, as well as the effect of bariatric surgery (BS). The purpose of this article is to discuss some contentious elements of the relationship between obesity and the thyroid: (1) Obesity and thyroid function, as well as the influence of BS (2) The effect of BS on thyroid hormone therapy (THT) in obese patients with hypothyroidism. To summarise: TSH

is moderately elevated in morbidly obese people. Morbid obesity is associated with a modest central resistance to thyroid hormone, which is reversible with weight loss. Following weight decrease in morbidly obese hypothyroid individuals, the levothyroxine dose/kg of ideal weight did not alter, despite an increase in the levothyroxine dose/kg of actual weight. In clinical practise, detecting mild hypothyroidism in morbid obesity is challenging; nevertheless, BS improves the altered thyroid function, and THT can be better adapted if it is based on optimal weight.

Keywords: obesity; endocrine abnormalities; bariatric surgery; hypothyroidism

INTRODUCTION

The thyroid hormone regulates dietary intake as well as total and resting energy expenditure, and as a result, obesity and other metabolic illnesses can develop in persons with impaired thyroid function. Furthermore, variations in total body weight and total body composition, body temperature, and metabolic expenditure describe altered thyroid function. Thyroid function tests are routinely used to determine the cause of obesity. Obesity is frequently associated with modestly elevated thyrotropin levels. It is unknown whether the altered thyroid function seen in obesity is caused by the extra weight or whether the reduced thyroid function is the source of the excess weight. The thyroid axis governs adipose tissue, white adipose tissue influences thyroid function. Obesity may be regarded as a neural system illness, and it is a major concern for the health system at the moment, with far-reaching implications for health care and society. The number of obese patients has steadily increased in recent years. Obesity has reached epidemic proportions in the last 40 years, and obesity-related disorders have steadily grown in the previous 30 years, owing mostly to cardiovascular disease. Obesity is prevalent in 22.9 percent of Spaniards, and it exceeds 20 percent in nearly all European countries. Obesity has an age-adjusted prevalence of 40.4 percent in women and 35.0 percent in men in the United States. For class 3 obesity (BMI 40 kg/m²), the equivalent figures are 9.9 percent for women and 5.5 percent for men. According to projection research, the prevalence of adult obesity and obesity with a BMI of 35 kg/m² would rise in the United States. Throughout the world, somewhat lower findings have been discovered. Weight reduction of as low as 5% improves function

in several organs and tissues at the same time, and increasing weight loss causes alterations in important adipose tissue metabolic processes. Compared to medical therapy, bariatric surgery employing laparoscopic banding, sleeve gastrectomy, or a laparoscopic Roux-en-Y Gastric Bypass has generated more notable ameliorations in illnesses related to obesity and a more marked drop in all-cause mortality. When compared to the general population, bariatric surgery was associated with a longer life length than medical therapy in obese patients, even though mortality remained high in both the surgical and usual care groups. Obesity-related ailments have also been observed to improve significantly after BS. These advantages in patients emerge early, before the occurrence of any considerable weight reduction, suggesting that the benefits are most likely related to changes in gastrointestinal hormone output caused by bariatric surgery. In contrast, in individuals with obesity and Type 2 diabetes treated with RYGB surgery or diet, the clinical improvement was quite comparable and appeared to be connected to weight reduction alone, suggesting that the advantages of BS are solely due to the impact of weight loss.

Subclinical primary hypothyroidism is the most common endocrine condition in obese people. It is recommended that all obese people be tested for abnormal thyroid function. Hypothyroidism, defined as an elevated circulating TSH value, affects up to 10% of individuals, with women being more affected than males. Obesity is associated with endocrine changes, such as a diminished growth hormone (GH) response to certain stimuli and altered thyroid function. Thyroxine

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levels are normal, increased, and decreased in obese patients; these disparities are likely because the patients were examined at different times, had different sexes and ages, and may differ in the severity and type of obesity, as well as the presence of obesity comorbidities. The current state of thyroid function disruption in obese individuals, as well as the influence of BS therapy on thyroid function alteration, is unknown. Various research has shown varying results about the change in thyrotropin following BS and the impact of weight loss. The effects of BS on free thyroxine (FT4) levels in obese persons are even more debatable.

As previously stated, the most common endocrine illness in obesity is reduced thyroid function, and circulating thyroid hormones should be measured in all obese individuals. Bodyweight is routinely used in clinical practice to determine the total dosage of levothyroxine (LT4) to provide in the presence of reduced thyroid function. Obese people have higher levothyroxine needs for a variety of reasons, including greater lean and fat mass, increased volume of distribution, and altered gastrointestinal tract absorption. As a result, weight loss due to BS may lower the requirement for levothyroxine. In contrast, by modifying the structure and physiology of the gastrointestinal system, the surgical procedure may cause a reduction in hormone absorption and, as a result, a rise in levothyroxine needs.

CONCLUSION

TSH levels are moderately elevated in morbidly obese people. Weight reduction causes a decrease in the high thyrotropin levels. This drop in thyrotropin following BS is caused by significant weight loss. These findings show that the somewhat raised thyrotropin levels found in obese patients are attributable to the increased adiposity of obesity. In practical practice, detecting mild hypothyroidism in severe obesity is challenging, and BS improves the mild hypothyroidism of severe excessive adiposity.