Increased circulating levels of betatrophin in patients with Hashimoto thyroiditis.

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INTRODUCTION
Hashimoto thyroiditis (HT) - is one of the most common autoimmune thyroid disorders and the most common cause of hypothyroidism, but the relation between HT and body mass is still unclear.

Leptin is a pleotropic adipokine, produced mainly by white adipose tissue. Increased leptin plasma level is observed in obesity and is critical for regulating food intake and energy expenditure, crucial for a number of physiological processes, such as inflammation, angiogenesis, hematopoiesis. Leptin influences immune reactivity and autoimmunity.

Betatrophin, also known as TDO2RFLIPL/igf/ANGPTLT1/C19orf80, is a novel protein predominantly expressed in human liver and adipose tissue. Betatrophin concentration is increased in patients with diabetes and obesity and is associated with insulin secretion. It also positively correlates with insulin resistance and BMI in non-diabetic subjects. Stimulators of betatrophin, such as thyroid hormones are usually relevant to thermogenesis.

In the present study we aimed to find out the relation between HT, obesity and betatrophin concentration.

MATERIAL AND METHODS
The study comprised 175 subjects, including 133 patients with diagnosed HT (mean age 44.6 ± 15.3 years, BMI 90.6%/0.4%) and 42 healthy individuals (mean age 40.8 ± 15.6 years, BMI 89.3%/10.7%), who had never been treated for any autoimmune diseases.

Serum TSH and betatrophin concentration were measured using an enzyme-linked immunoassay (DiaSource, Louvain-la-Neuve, Belgium). Anti-peroxidase antibodies (TPOAb), leptin and TNFα levels were also determined by immunoassays (Euroimmun, Lubeck, Germany and R&D Systems, Minneapolis, USA, respectively).

All patients were checked with body analyzer INBODY 220 (Direct Segmental Multi-frequency Bioelectrical Impedance Analysis Method, Biospace, Korea), which allows measurements of body mass, total body water (TBW), fat and free fat mass, skeletal muscle mass (SMM), BMI, the percent of body fat (PBF) and basic metabolic rate (BMR).

Reliability of an estimated BMI was confirmed by calorimetric method performed in 5 patients with HT. Differences between these results were smaller than 5%.

Concentrations of betatrophin and leptin were measured in group of patients with HT and controls in which differences of body composition measurements were not statistically significant.

RESULTS
Increased body mass was observed in 72% of the HT patients, including overweight in 38% and obesity in 35% of them. In the control group overweight or obesity was observed in 38% of the subjects studied.

CONCLUSIONS:
Among the patients with HT, even in euthyroidism, the problem of overweight and obesity is significantly more common than in the healthy individuals. Patients with HT, have significantly higher betatrophin concentrations than healthy individuals, even in euthyroidism with normal body mass. Our results suggest that betatrophin could cause the increase in fat mass, especially in patients with autoimmunity of thyroid gland.

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