Evaluation of the interrelations between thyroid function, insulin resistance, lipid profile, C-reactive protein and homocysteine in patients with autoimmune thyroiditis

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Introduction

In patients with autoimmune thyroiditis, thyroid function appears to be related to increased cardiovascular risk.

Objective

It was our objective to evaluate the relationship between TSH, insulin resistance, lipid profile, C-reactive protein (CRP) and homocysteine in patients with autoimmune thyroiditis (AIT).

Methods

- We assessed medical records of 242 patients with autoimmune thyroiditis from consultation of Endocrinology.

- Patients with other autoimmune diseases, diabetes mellitus, oncologic pathology, previous cardiovascular events and taking medication to dyslipidemia or thyroid disease were excluded.

- We defined 2 groups:
  - **Group 1** (n = 171) - euthyroid state: TSH 0.35-2.0 μIU/ml, ft3 1.71 - 3.71 pg/ml and ft4 0.70-1.48 ng/dl
  - **Group 2** (n = 71) - subclinical hypothyroidism: TSH> 2.0 UI/ml, ft3 1.71 - 3.71 pg/ml and ft4 0.70 -1.48 ng/dl

- We recorded thyroid function tests, anti-TPO and antithyroglobulin antibodies, total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides, apolipoproteinA1, apolipoproteinB, lipoprotein(a), homocysteine, high sensitivity CRP, folic acid, vitamin B12, HOMA-IR (Homeostasis model assessment insulin resistance), HOMA-β (Homeostasis model assessment β cell), QUICKI (Quantitative insulin sensitivity check index), HISI (Hepatic insulin sensitivity index), WBISI (Whole body insulin sensitivity index) and IGI (Insulinogenic index) for both groups.

- Statistical analysis was performed with Mann-Whitney test, logistic regression and Spearman correlations. Statistical significance was considered for a bilateral value of p<0.05.

Results

- We found significantly higher levels of insulin at 120 min of OGTT in the patients with TSH >2.00 μIU/ml (65.9±57.8 vs 84.1±65.4 μIU/ml; P=0.02).

- The levels of homocysteine were also significantly higher in the group with TSH >2.00 μIU/ml (10.8±12.6 vs 8.3±3.3 μmol/l; P=0.04).

- We found the IGI (0.036±0.378 vs 0.252±0.310; P=0.02) and WBISI (6.523±7.335 vs 6.112±4.019; P=0.003) indexes to be significantly higher in the TSH >2.00 μIU/ml group.

- Spearman correlations:
  - **Group 1 (TSH 0.35-2.0 UI/ml):**
    - In the group with TSH <2.00 μIU/ml there were positive correlations between IGI and the triglyceride levels (r=0.256; P=0.004) and the anti-TPO levels (r=0.137; P=0.03).
    - In the same group we found negative correlations between WBISI and CRP (r=-0.199; P=0.02) and positive correlations between WBISI and TSH (r=0.44; P=0.01).
  - **Group 2 (TSH >2.0 UI/ml):**
    - In the group with TSH >2.00 μIU/ml we found positive correlations between the FT4 levels and the BMI (r=0.413; P<0.001).
    - In the same group the levels of LDL were positively correlated with TSH (r=0.245; P=0.04), and negatively with FT3 (r=-0.265; P=0.02).
    - There was also a positive correlation between the Lp(a) and FT4 levels (r=0.259; P=0.04).

Conclusions

In patients with AIT, the relationship between thyroid function, lipid profile, homocysteine and the insulin resistance indexes, may contribute to an increased cardiovascular risk.