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 µUI/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.

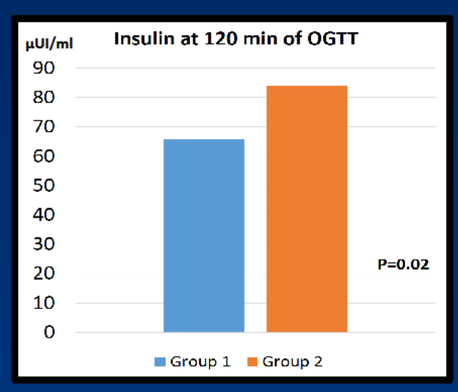
• Statistical analysis was performed with Mann-Whitney test, logistic regression and Spearman correlations. Statistical significance was considered for a bilateral value of $p<0.05$.

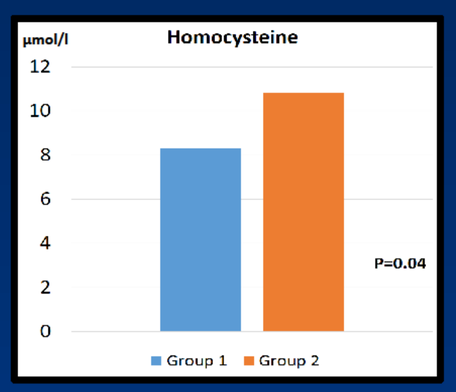
Results

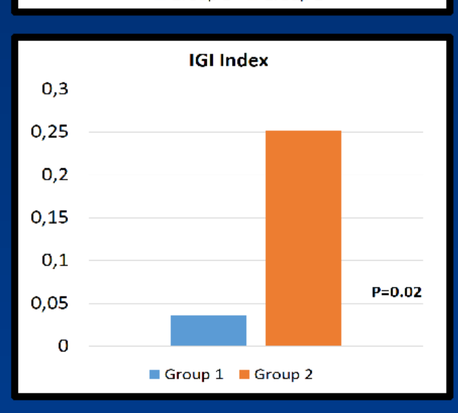
• We found **significantly higher levels** of **insulin at 120 min of OGTT** in the **patients with TSH >2.00 µUI/ml** (65.9±57.8 vs 84.1±65.4 µUI/ml; P=0.02).

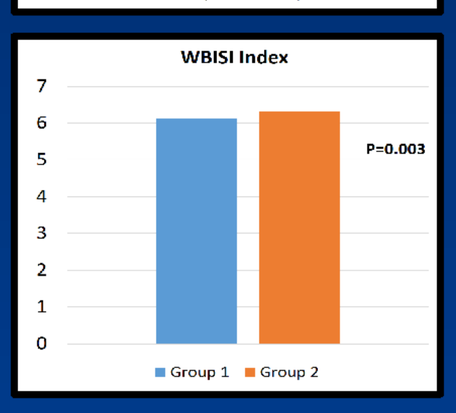
• The levels of **homocysteine** were also **significantly higher** in the **group with TSH >2.00 µUI/ml** (10.8±12.6 vs 8.3±3.3 µmol/l; P=0.04).

• We found the **IGI** (0.036±0.378 vs 0.252±0.310; P=0.02) and **WBISI** (6.323±7.335 vs 6.112±4.019; P=0.003) indexes to be **significantly higher in the TSH >2.00 µUI/ml group**.









• **Spearman correlations:**

  • **Group 1 (TSH 0.35-2.0 UI/ml):**

    • In the group with TSH <2.00 µUI/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 µUI/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**