

# THYROID FUNCTION AND AUTOIMMUNITY IN CHILDREN WITH NEWLY DIAGNOSED TYPE 1 DIABETES MELLITUS

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## Background

- Patients with type 1 diabetes (T1DM) are at a high risk of having other autoimmune diseases.
- The most common coexisting disease is autoimmune thyroiditis, which is diagnosed in 15-30 % diabetic patients.
- The incidence of the disease depends on the age, sex and duration of T1DM.

## Aims and Objectives

- This study aims to assess the prevalence of anti-thyroid peroxidase antibodies and anti-thyroglobulin antibodies in children with newly diagnosed T1DM.

## Method

- The analysis involved cases of new onset T1DM that were recorded from 01.01.2008 to 31.12.2014, in children  $\leq 18$  years from Wielkopolska Province, Poland.
- The measurement of the levels of TPO-ab, TG-ab and TSH, triiodothyronine and thyroxine (Immunoassay) were performed.
- The unpaired Student t-test was used to compare continuous variables, and the chi-square test was used to compare percentages among different patients subgroups.
- A P-value  $< 0.05$  was considered significant.

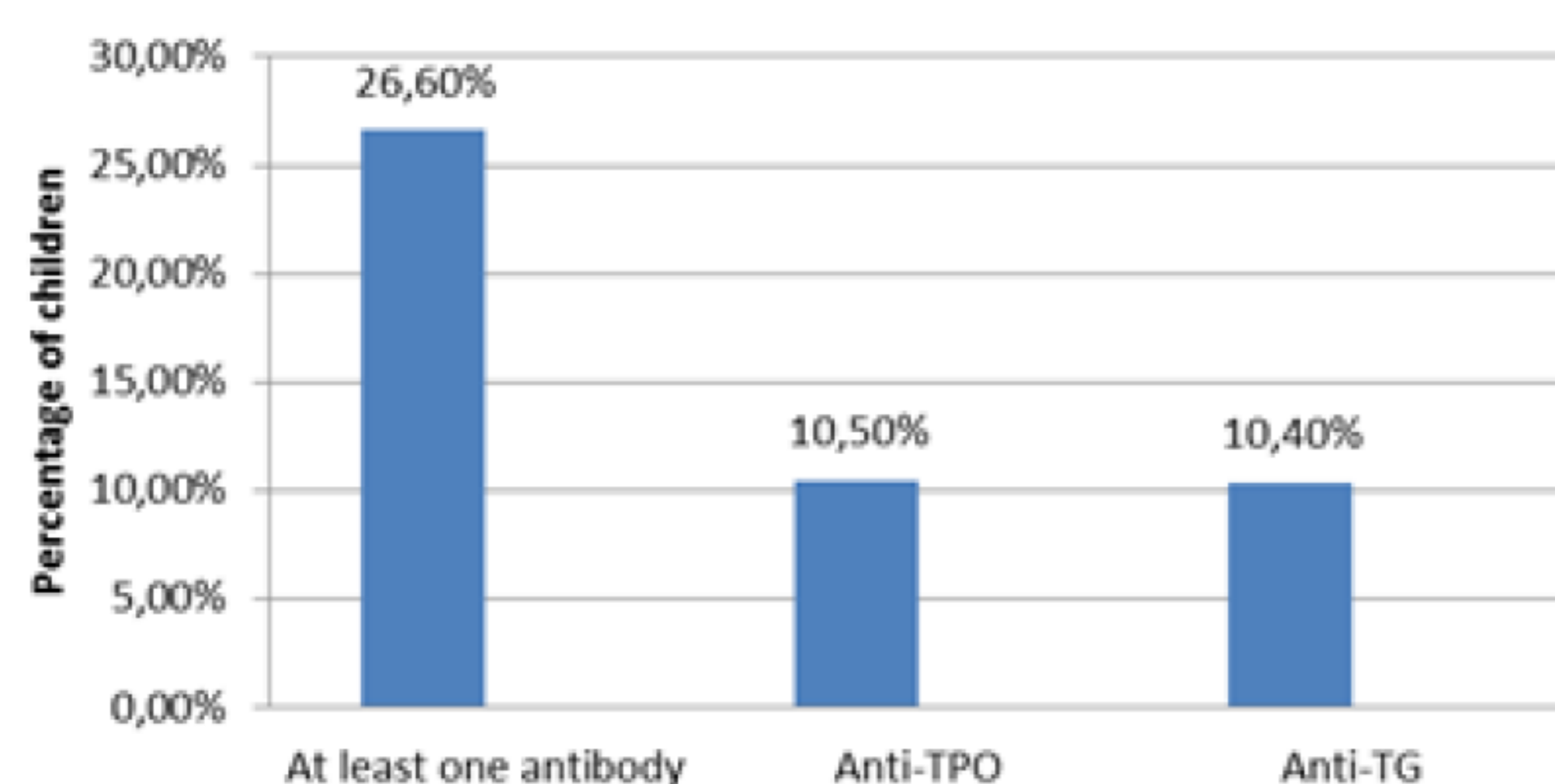
## Results

- 779 new cases of T1DM were identified.
- The mean age at diagnosis was  $9.4 \pm 4.5$  years.
- 575 patients were positive for IA2-Ab, 519 for GAD-Ab, and 371 for IAA.
- 612 patients were tested for thyroid antibodies, of which 163 children were positive for at least one antibody.
- The prevalence of TPO-ab and TG-ab were 10.5% and 10.4%, respectively. GAD-Ab has occurred most frequently in thyroid Ab positive patients ( $p = 0.04$ ) and IAA in thyroid Ab negative patients (0.001).
- TPO-ab was reported significantly more often among girls ( $p = 0.0008$ ) and children up to 10 years of age ( $p = 0.002$ ).
- Patients with thyroid Ab positive results revealed elevated TSH level ( $p = 0.03$ ) and higher HbA1c level ( $p = 0.02$ ) comparing to thyroid Ab negative individuals.

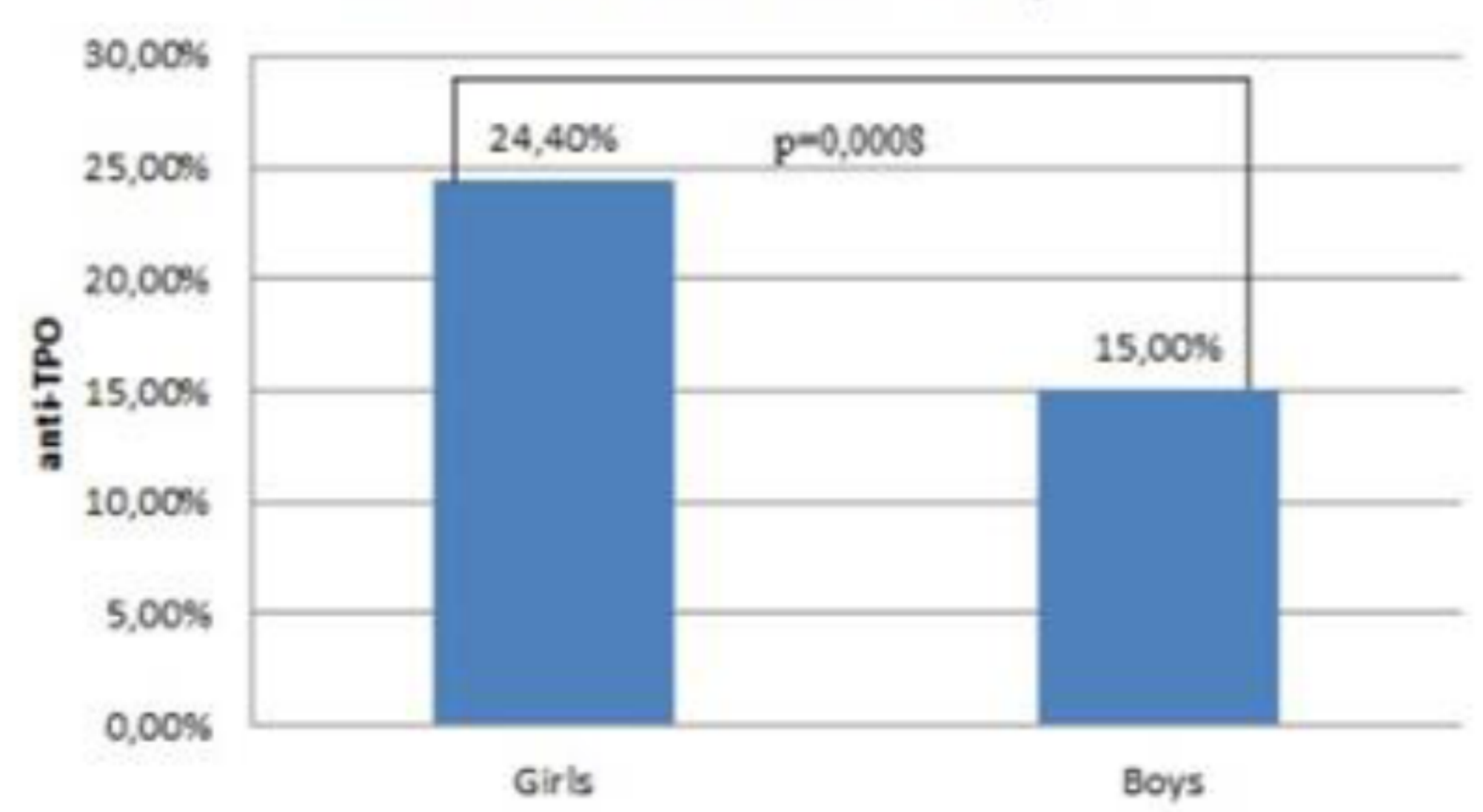
## Comments

- The incidence rate of T1DM is shifting toward younger children, who manifest rather IAA and IA2ab, than GAD-ab presence at their diabetes diagnosis.
- It seems despite such a tendency, the studied thyroid antibodies maintain characteristic for thyroiditis distribution by age and sex among these children and correlate with GAD-ab, which are also more frequently positive in adolescents at T1DM beginning.

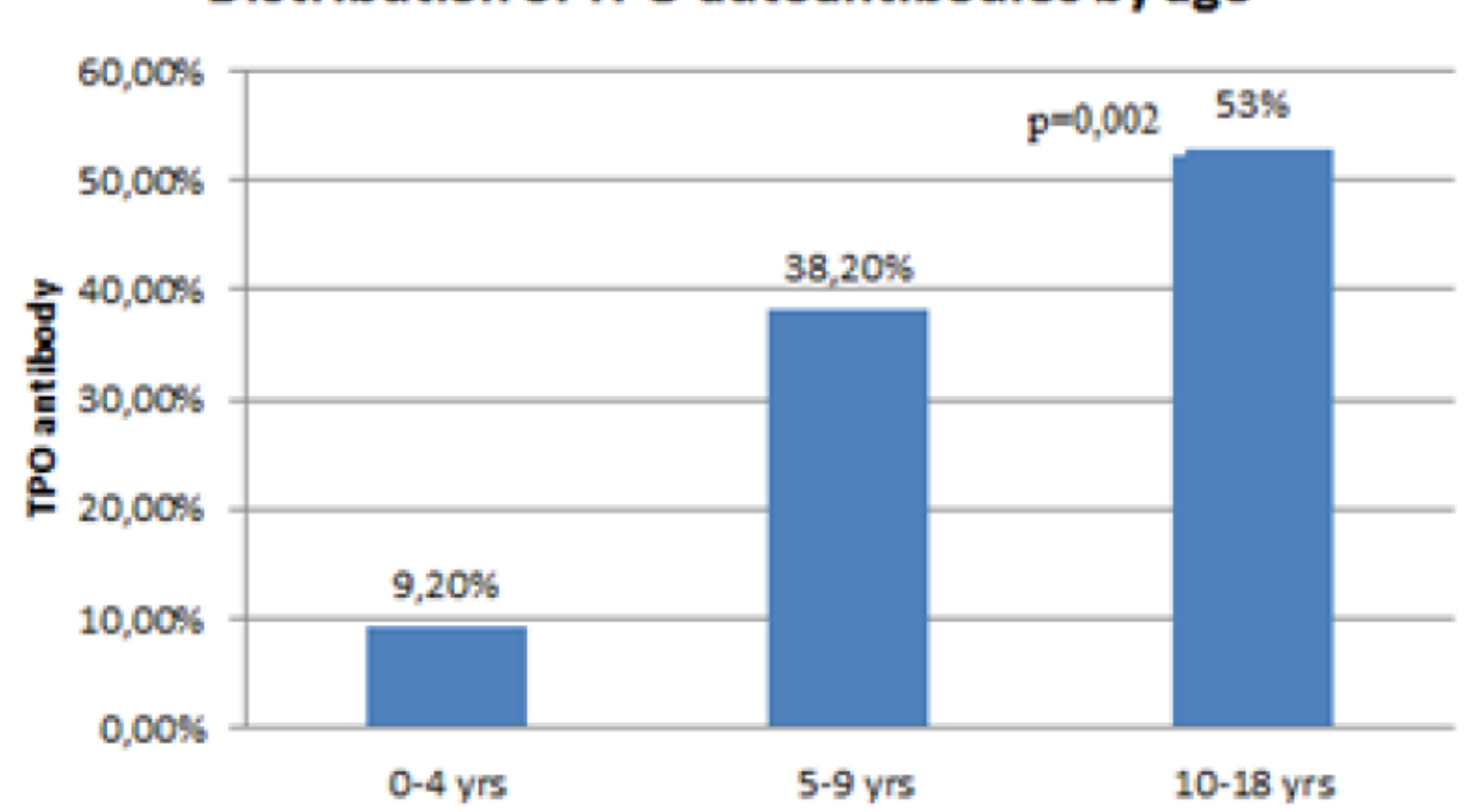
Autoimmune thyroiditis associated autoantibodies at time of T1DM diagnosis in children aged 0-18 years



Distribution of TPO antibodies by sex



Distribution of TPO autoantibodies by age



Clinical features of T1DM patients with and without thyroid antibodies.

Variable	All patients (n=779)	Thyroid Ab positive (n=163)	Thyroid Ab negative (n=449)	P-value
Sex (M:F)	430:348	64:99	233:216	0.17
Age (yr)	9.4 $\pm$ 4.5	9.9 $\pm$ 4.4	9.5 $\pm$ 4.4	0.18
HbA1c (%)	11.3 $\pm$ 2.1	11.5 $\pm$ 2.1	11.1 $\pm$ 1.9	0.02
<b>Children 0-4 years</b>				
TSH uIU/mL	2.07 $\pm$ 1.1	2.12 $\pm$ 1.14	1.79 $\pm$ 0.80	0.13
ft3 pg/mL	1.85 $\pm$ 0.11	2.12 $\pm$ 0.58	2.35 $\pm$ 0.57	0.12
FT4 ng/dL	0.96 $\pm$ 0.26	1.02 $\pm$ 0.15	0.99 $\pm$ 0.23	0.30
<b>Children 5-9 years</b>				
TSH uIU/mL	2.54 $\pm$ 1.06	2.55 $\pm$ 1.81	2.21 $\pm$ 1.46	0.10
ft3 pg/mL	2.05 $\pm$ 0.60	2.29 $\pm$ 0.54	2.57 $\pm$ 0.45	0.002
FT4 ng/dL	1.14 $\pm$ 0.22	1.17 $\pm$ 0.38	1.16 $\pm$ 0.17	0.72
<b>Children &gt; 10 years</b>				
TSH uIU/mL	2.56 $\pm$ 1.87	2.56 $\pm$ 2.99	1.90 $\pm$ 0.92	0.03
ft3 pg/mL	1.94 $\pm$ 0.50	2.67 $\pm$ 0.62	2.38 $\pm$ 0.53	0.01
FT4 ng/dL	1.18 $\pm$ 0.23	1.16 $\pm$ 0.23	1.09 $\pm$ 0.17	0.53
Pancreatic AB positive (%)	91.1	94.2	94.6	0.83
GAD U/ml positive (%)	66.7	73.1	65.7	0.04
IAA % positive (%)	47.6	44.3	57.6	0.001
IA2-AB U/ml positive (%)	73.8	78.8	79.7	0.78

