

The analysis of occurrence the zinc transporter antibodies ZnT8 in children with Graves' disease and Hashimoto's thyroiditis.

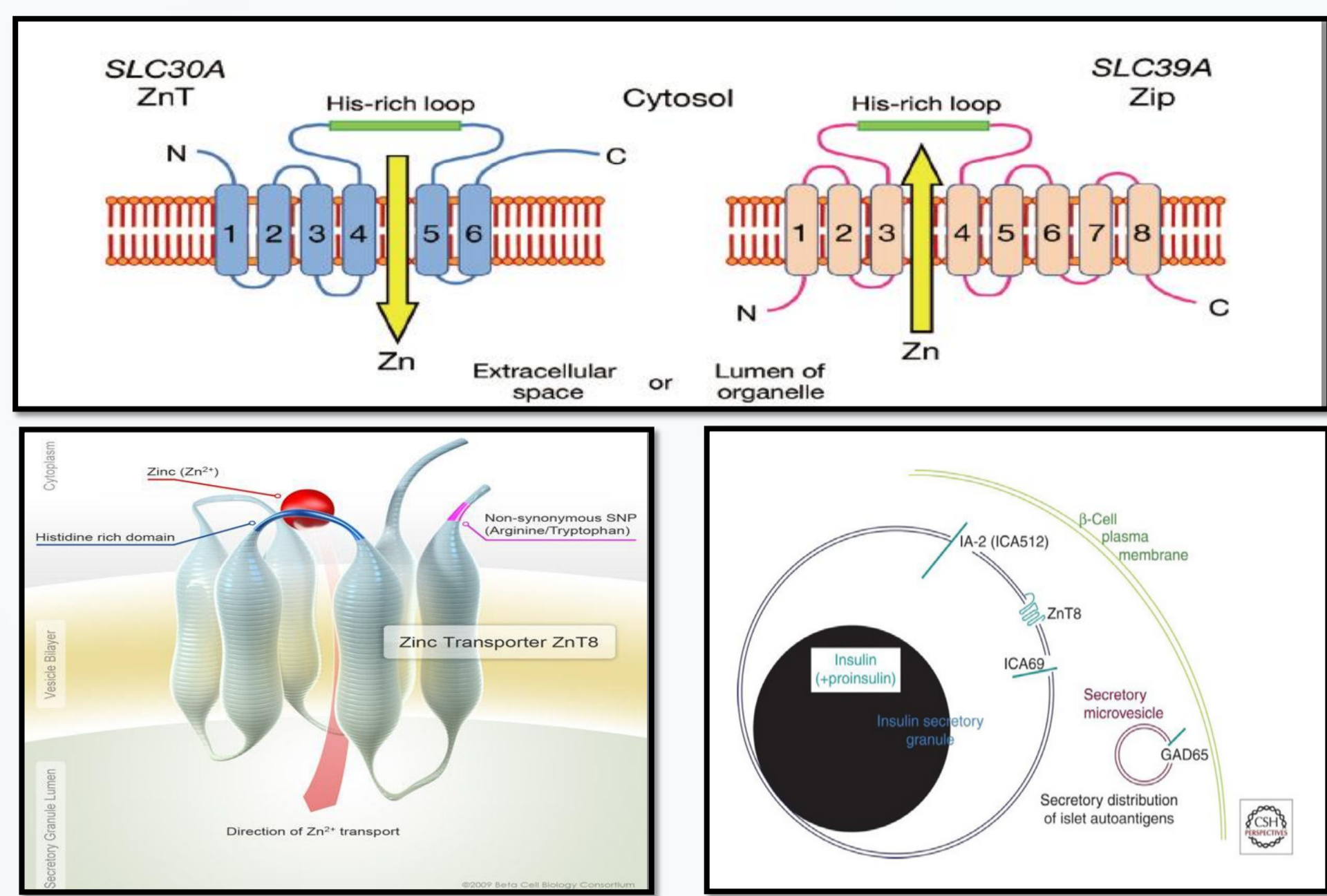


P1-148 The authors have nothing to disclose

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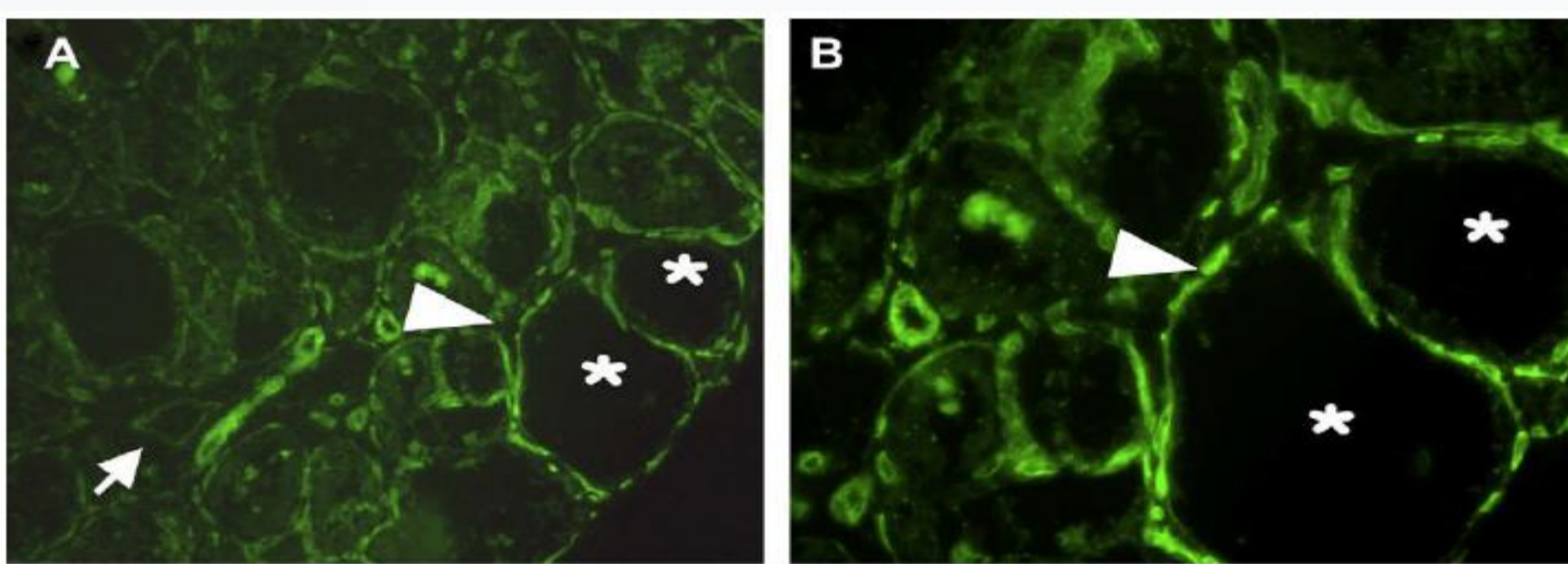
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Objectives



Structure and localization of ZnT8 transporter according to Kawasaki E. *Endocrine Journal* 2012, 59 (7), 531-537

Localization of ZnT8 transporter in animal model of thyroid tissues



Immunolocalization of ZnT8 transporter using anti-ZnT8 antibodies (a, b) in epithelium of thyroid follicular cells. *Murgia C et al. Nutrition, Metabolism & Cardiovascular Diseases* (2009) 19, 431-439

Materials and Methods

The study was performed in the group consisting of 20 Graves' disease patients (mean age, 17.8±14), 44 Hashimoto's thyroiditis patients (mean age, 13.83±3.5), 83 with DT 1 (mean age, 14±4.7) and 57 healthy controls (mean age, 13.12±3.5). They were hospitalised in endocrine outpatient clinic.

FIRS Laboratories, RSR Ltd based at Parc Ty Glas, Llanishen, Cardiff CF14 5DU, UK:

-GAD65 Ab was measured by ELISA using kits from RSR Ltd (Cardiff, UK) and values of **GAD65 Ab of ≥5.0** WHO units/mL (National Institute for Biological Standards and Control; NIBSC 97/550) were considered positive.

-IA-2 Ab was measured using an immunoprecipitation assay (IPA) based on 125I-labelled IA-2 (kits from RSR Ltd). **IA-2 Ab levels >1** WHO units/mL were considered positive.

-**Insulin Ab** were measured using immunoprecipitation assay **with >0.4 U/mL** value considered positive (RSRLtd, UK)
 -Autoantibodies to ZnT8 were measured by ELISA using kits from RSR Ltd and values of **ZnT8Ab of ≥15 units/mL** were positive.

In the Islet Autoantibody Standardization Program 2012 (IASP 2012), the GAD65 Ab ELISA showed 74% sensitivity and 99% specificity, IA-2 Ab 74% sensitivity and 98% specificity, ZnT8 Ab ELISA 72% sensitivity and 99% specificity.

- **21OH Ab** were measured with immunofluorescence method with **value >1 U/ml** considered positive (RSR Ltd, UK)

- **ARCh Ab** were measured using immunoprecipitation assay ¹²⁵I-labelled (kits from RSR Ltd.) (≥ 0.5 nmol/L).

Children's University Hospital Laboratory in Białystok, Poland:

- Antithyroid antibodies (anti-TPO >34 lu/ml, anti-TG >115 lu/ml, anti-TRAb >1.7 IU/ml)

electrochemiluminescence method (Roche Diagnostics, Poland)

-tissue transglutaminase antibodies, t-TGA (immunoenzymatic method, >10 lu/ml)

Prevalence of positive antibodies were then analysed according to:

-Gender (boys/girls)

-Patient age (up to 5 yrs, between 5 and 10 yrs, and above 10 yrs)

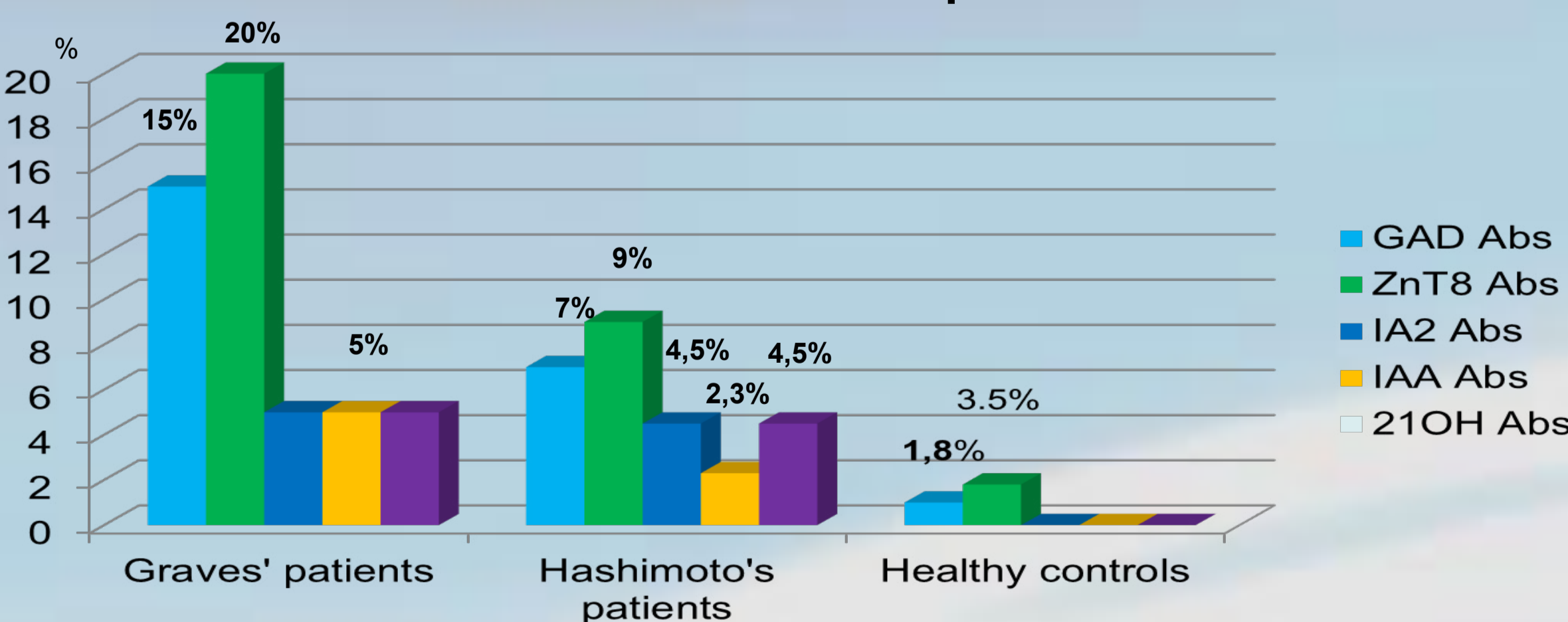
-Disease duration ((up to 5 yrs, between 5 and 10 yrs, and above 10 yrs)

-HbA1c value (<7.5% and > 7.5%)

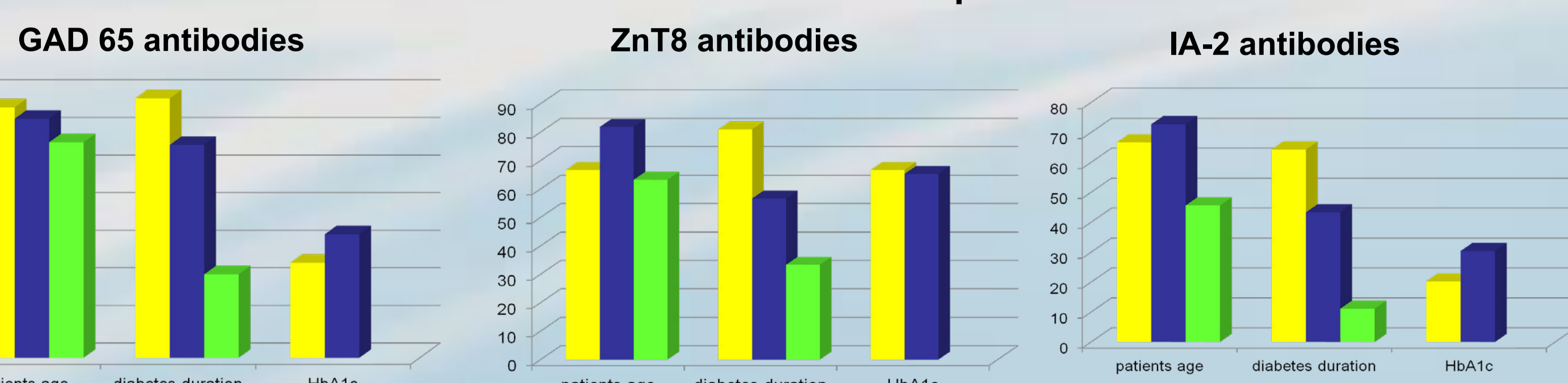
Figures and tables

	Graves' patients	Hashimoto thyroiditis	DT1	Healthy controls	*p, **p
Female/male (n)	20 (18/2)	44 (38/6)	83 (68/15)	57 (50/7)	
Age (years)	17.8±14	13.83±3.5	14.3±3	13.12±3.5	NS, NS, NS
Weight(kg)	55.19±2.39	58±5.28	56.2±7.8	57±4.5	NS, NS, NS
Height (cm)	160.3±3.69	156.6±4.3	158±8	157.2±4	NS, NS, NS
FT4 (ng/dl)	7.18±2.7	1.8±0.63	1.2±0.46	1.1±0.8	*p<0.001, NS, NS
FT3 (ng/dl)	12.19±2.27	3.08±0.5	3.2±0.38	3.1±1.1	*p<0.001, NS, NS
TSH (μU/ml)	0.37±1.1	9.87±4.37	3.04±0.72	2.5±1.6	p<0.01, p<0.025, NS
TRAb (U/l)	12.5±4.2	0.5±0.31	0.4±0.22	0.5±0.6	*p<0.001, NS, NS
anti-TGAb (IU/mL)	447.6±96.5	620.98±240.34	98.6±40.6	58.8±30.2	*p<0.01, **p<0.001, NS
anti-TPOAb (IU/mL)	332.4±68.7	482.2±62.43	56±32.3	34±22.8	*p<0.01, **p<0.001, NS
treatment	Methimazole	L-thyroxine	Insuline	-----	

Prevalence of antibodies in AITD patients



Prevalence of antibodies in diabetic patients



Results

In our study we observed the presence of ZnT8 Ab in 4 patient (20%) in the case of Graves' disease patients while 3 patient (15%) in this group was positive for GAD Ab. In the case of Hashimoto's thyroiditis 4 patients (9%) were positive for ZnT8Ab. One of ZnT8 Ab positive HT patients had additionally positive GAD Ab and IA-2 Ab. In patients with DT1 we identified positive ZnT8 Ab (65.06%), GAD Ab (57.83%) and IA2 (49.4%) antibodies.

Autoantibodies results	Graves' patients n=20	Hashimoto's thyroiditis n=44	DT 1 n=83	Healthy controls, n=57
anti-TRAb	90%	16.4%	-	-
aTPO Abs	82%	90%	22%	-
aATG Abs	54%	75%	18%	3.5%
GAD Abs	15%	7%	57.83%	1.8%
IA-2 Abs	5%	4.5%	49.4%	-
IAA Abs	5%	2.3%	+	-
ZnT8 Abs	20%	9%	65.06%	3.5%
tTGA Abs	10%(2)	6.8%(3)	9.6%(8)	-
21OH Abs	5%	4.5%	2.4%	-

Conclusions

1. In patients with autoimmune thyroid disease the most frequent (except anti-thyroid Abs) were anti-ZnT8 Abs.
2. Our results may suggest that the presence of ZnT8Ab may be associated not only with T1DM but other autoimmune diseases, in particular with Graves' disease and Hashimoto's thyroiditis.
3. Diabetes type 1 and celiac disease were the most common concomitant autoimmune disease in our patients with AITD.
4. The prevalence of antibodies in children with diabetes type 1 increases with patients age and in cases with poor metabolic control.
5. Taking into consideration the fact that diabetes mellitus type 1 is the risk factor to coincidence another autoimmune disease, screening which uses autoantibodies is a proper action. It can result in separating groups with a higher risk of other autoimmune diseases, monitoring them, and finally early detecting and treating. All this can prevent further complications.

