

Analysis of zinc transporter (ZnT8) autoantibodies in children and adolescents with autoimmune thyroid diseases

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Introduction:

Recent studies have revealed the presence of zinc and the expression of zinc transporter (ZnT) family members in most endocrine cell types. It was demonstrated that ZnT family plays an important role in the synthesis and secretion of many hormones. Moreover, recently ZnT8 was described as a newly islet autoantigen in type 1 diabetes.

Aim of Study:

We studied the prevalence of ZnT8Ab in children with autoimmune thyroid diseases (AITD) to assess the association of AITD and type 1 diabetes mellitus at the serological level.

Materials and Methods:

The study was performed in the group consisting of patients with 44 Graves' disease (GD), 66 Hashimoto's thyroiditis (HT), 199 with T1DM (163 with only T1DM and 36 with both T1DM and GD or HT), and 58 healthy controls.

Antibodies against GAD, IA-2, insulin, ZnT8, 21-hydroxylase (21-OH) and acetylcholine receptor (AChR) were measured in subjects.

	Graves disease (GD)	Hashimoto thyroiditis (HT)	Type 1 Diabetes mellitus (T1DM)	T1DM + GD or HT	Controls
Number	44	66	163	36	58
Female	32	57	77	26	25
Male	12	9	86	5	33
Age (years)	14.4±3.1	13.0±3.7	12.4±4.1	13.2±4.3	13.3±3.5
Disease duration (years)	1,2±2,3	2,2±2,1	4,4±3,6	4,3±3,6	-

Table I: Characteristics of the study groups

Results:

	Graves disease (GD)	Hashimoto thyroiditis (HT)	Type 1 Diabetes mellitus (T1DM)	T1DM + GD or HT	Controls
Number	44	66	163	36	58
GAD Ab	4 (9,1%)	4 (6,1%)	108 (66%)	25 (69%)	2 (3,4%)
IA-2 Ab	2 (6,1%)	4 (6,1%)	91 (56%)	18 (50%)	0 (0%)
ZnT8 Ab	4 (9,1%)	6 (9,1%)	109 (67%)	19 (53%)	2 (3,4%)
Insulin Ab	1 (2,2%)	3 (4,5%)	125 (77%)	32 (89%)	0 (0%)
21-OH Ab	2 (4,5%)	5 (7,6%)	Not tested	1 (3%)	0 (0%)
AChR Ab	0 (0%)	0 (0%)	Not tested	0 (0%)	-

Table II: Antibodies in tested groups

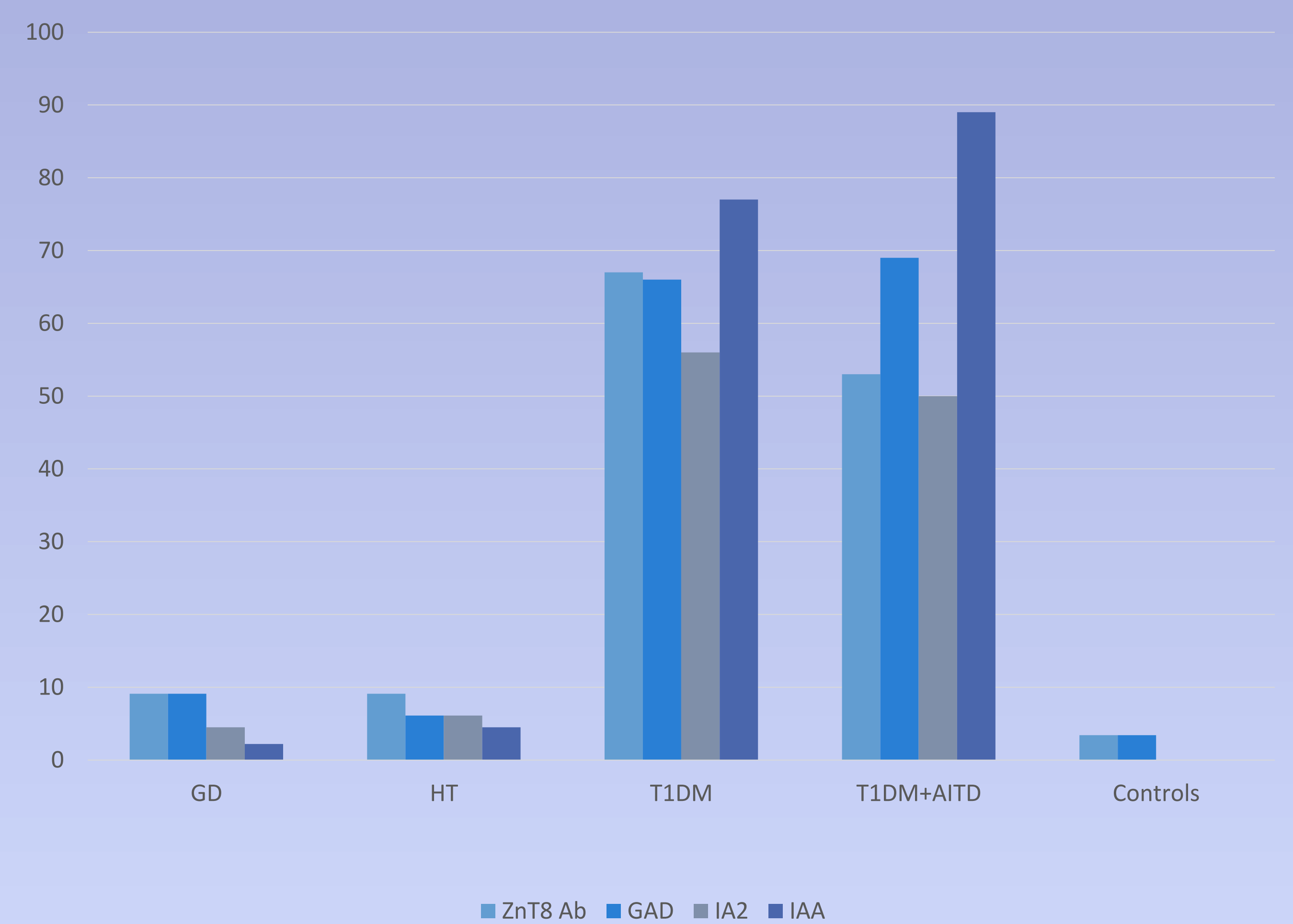


Fig. I: Antibodies in tested groups (%)

Gender	Age, years	Diagnosis	GAD Ab U/ml	IA2 Ab U/ml	ZnT8Ab U/ml	Insulin Ab U/ml	21-OH Ab U/ml	TgAb IU/ml	TPO Ab IU/ml	Adrenal function
M	13	GD	Neg	Neg	Neg	Neg	82,6	444,06	>1000	Normal
F	13	GD	Neg	Neg	Neg	Neg	39,7	149,83	>1000	Normal
F	17	HT	Neg	Neg	Neg	Neg	78,7	80	196,1	Normal
F	14	HT	Neg	Neg	Neg	Neg	12,9	617,9	>600	Adrenal insufficiency
F	17	HT	Neg	Neg	Neg	Neg	11,9	14,3	689,6	Normal
F	12	HT	Neg	Neg	Neg	Neg	910	240	115	Adrenal insufficiency
M	14	HT	Neg	Neg	Neg	Neg	15,1	350	>600	Adrenal insufficiency
M	16	T1DM, GD	2000	1,2	Neg	22,1	748	39,78	770,19	Normal

Table III: Characteristics of 21-OHAb positive children

Conclusions:

Diabetes associated autoantibodies including ZnT8Ab were found in children and adolescents with GD and HT. Antibody screening may be a useful strategy in identifying patients with higher risk of developing other autoimmune diseases, monitoring them, and enabling early detection and treatment to prevent further complications.

References

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