



GAD Antibody Positivity is Associated with Higher Prevalence of Autoimmune Thyroiditis in Children with Type 1 Diabetes Mellitus

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Background

The prevalence of autoimmune thyroid disease is higher in children with type 1 diabetes mellitus (T1DM).

Objective

The aim of this study is to compare the frequency of autoimmune thyroiditis (AT) in children with T1DM according to the presence of diabetes autoantibodies.

Method

This study included 533 (49% female) children with T1DM based on hospital records from a single center. Frequency of glutamic acid decarboxylase antibodies (GADA) (n=252), insulin antibodies (IA) (n=250) and islet cell antibodies (ICA) (n=264) determined at T1DM onset were compared with the frequency of positivity of anti-thyroglobulin and/or thyroid peroxidase antibodies (n=404) determined in a follow-up duration of 0-16.5 years (median 3.2 years).

Results

- Age of diabetes onset (year) 8.53±4.11 (range 0.59-17.7)
- AT was more frequent in girls (28.9% vs 15.5%, **p=0.001**) than boys.
- The percent of AT was 28.0 (n=37) and 10.8 (n=9), in GADA positive and negative patients respectively ($\chi^2=8.950$, **p:0.003**) (Table 2).

Relative risk: 2.6 (95 % CI 1.3-5.0), p: 0.006

- IA or ICA positivity did not show any significant association with prevalence of AT.

IA positive vs negative 26.9% vs 18.4%, p:0.157

ICA positive vs negative 23.0% vs 20.2%, p:0.612

Table 1. Frequency of diabetes antibodies' positivity

	% of positivity
GADA (n=252)	60.3%
IA (n=250)	31.6%
ICA (n=264)	54.5%

Table 2. GADA and autoimmun thyroid disease

GADA %(n)	Thyroid autoantibody		X ² :8.950 p:0.003
	Positive	Negative	
Positive	28.0 (37)	72.0 (95)	
Negative	10.8 (9)	8.9 (74)	

Discussion

- ✓ In this study it was shown that in children with T1DM, GADA positivity carries a 2.6 fold higher risk for AT
- ✓ In a study by Kordonouri et al. estimated that GADA positive patients have a 3.5-fold increased risk of AT¹.
- ✓ Similarly, Kawasaki et al. demonstrated that high levels of GADA were present in T1DM with AT².
- ✓ Martino et al. found significantly higher frequency of anti-TPO among GADA positive than among GADA negative adults with newly-diagnosed type 1 diabetes mellitus.

References

- ¹Kordonouri O, Charpentier N, Hartmann R. GADA positivity at onset of type 1 diabetes is a risk factor for the development of autoimmune thyroiditis. *Pediatr Diabetes*. 2011; 12: 31-3.
- ² Kawasaki E, Takino H, Yano M et al. Autoantibodies to glutamic acid decarboxylase in patients with type 1 diabetes and autoimmune thyroid disease. *Diabetes* 1994; 43: 80-6.
- ³ Martino GV, Tappaz ML, Braghi S et al. Autoantibodies to glutamic acid decarboxylase (GAD) detected by an immuno-trapping enzyme activity assay: relation to insulin-dependent diabetes mellitus. *Journal of Autoimmunity* 1991; 4: 915-23.