



# 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 <sup>2</sup> :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 AT<sup>1</sup>.
- ✓ Similarly, Kawasaki et al. demonstrated that high levels of GADA were present in T1DM with AT<sup>2</sup>.
- ✓ 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

- <sup>1</sup>Kordonouri 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.
- <sup>2</sup> 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.
- <sup>3</sup> 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.