



Elevated anti-tissue transglutaminase antibodies in children newly diagnosed with type 1 diabetes do not always indicate celiac disease

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Introduction: Prevalence of celiac disease is 5–10 times higher in patients with type 1 diabetes mellitus (DM) than in the general population. Therefore, celiac serology should be screened intermittently in type 1 DM patients. However, anti-tissue transglutaminase (anti-TTG) antibody elevation may be detected incidentally at the time of type 1 DM diagnosis and regress spontaneously during follow-up, without medical or dietary interventions.

Objective

The aim of this study was to determine the prevalence of spontaneous normalization of anti-TTG in type 1 DM patients with positive anti-TTG titers at time of DM diagnosis, and the factors associated with this phenomenon.

Methods

Patients who were diagnosed with type 1 DM between July 1999 and May 2018 and whose anti-TTG levels were tested at time of diagnosis were included in the study. Clinical, laboratory, and treatment data of the patients were recorded. Patients with high anti-TTG titer were divided into two groups for statistical analysis: those whose celiac serology was positive at diagnosis and spontaneously normalized during follow-up, and those who were diagnosed with celiac disease.

Results

- ✓ A total of 294 patients (142 male [48.3%], 152 female [51.7%]) with a mean age of 9.1 years (1.1–17.7 years) were included in the study (Table 1).
- ✓ Elevated anti-TTG titer was detected in 9.5% (n=28) of the patients at the time of diagnosis. Of these, 60.7% (n=17) were diagnosed with celiac disease with consistent biopsy findings, while 39.3% (n=11) exhibited spontaneous normalization of celiac serology.
- ✓ Anti-TTG titers greater than 10 times the upper limit at time of DM diagnosis were observed in 52.9% of the celiac patients, compared to 9.1% of the patients that showed spontaneous normalization (p<0.05) (Table 1).
- ✓ Anthropometric measurements and gastrointestinal symptoms did not differ significantly between the two groups (Table 1).

Table 1. Comparison of demographic, clinical and laboratory findings between two groups.

Group (n)	Group 1 (17)	Group 2 (11)	P
Female, n (%)	12 (70,6)	6 (54,5)	-
Age (month), median (IQR)	85,1 (13 – 182)	118,7 (51 – 213)	0,134
Anthropometric measurements, median (IQR)			
Weight (SDS)	-0,14 (-3,33 – 1,79)	0,2 (-1,14 – 2,02)	0,746
Height (SDS)	-0,06 (-1,16 – 1,85)	0,44 (-0,93 – 2,3)	0,122
BMI (SDS)	-0,13 (-2,33 – 1,87)	-0,01 (-1,5 – 2,4)	0,890
Abdominal Pain, n (%)	3(17,6)	2(18,2)	0,916
TTG antibody level, n (%)			
Positive but <3 times upper limit of normal	3(17,6)	5(45,5)	
>3 times but <10 times upper limit of normal	5(29,4)	5(45,5)	
>10 times upper limit of normal	9(52,9)	1(9,1)	<0.05
Laboratory tests at the time of diagnosis, median (IQR)			
Triglycerides	90,9 (45 – 172)	334,1 (48 – 2193)	0,305
Total Cholesterol	160,1 (104 – 199)	173,3 (132 – 269)	0,646
LDL	92,4 (49 – 129)	86,9 (54 – 133)	0,413
HDL	49,6 (34 – 73)	51,5 (19 – 91)	0,919
HbA1c	8,9 (5,8 – 14,1)	11,2 (6,8 – 15,1)	<0.05

(Group 1: Patients with celiac disease in follow-up, Group 2: Patients with spontaneous negative anti-TTG titers in follow-up)

Conclusion

- Type 1 DM patients may have high anti-TTG titers at the time of diagnosis. However, this is not always an indicator of celiac disease, and antibody titers may normalize during follow-up.
- In the literature, spontaneous normalization of anti-TTG antibody titers is reported in 35.4–59% of type 1 DM patients. Consistent with the literature, this rate was 39.3% in our study.
- For this reason, monitoring antibody titers should be considered for asymptomatic patients with mild anti-TTG antibody elevation at time of DM diagnosis before recommending gluten-free diet and referring for biopsy. Screening for celiac disease at least 6 months after type 1 DM diagnosis is a more rational approach.