SHORT COMMUNICATION

Screening for Celiac Disease in Diabetic Children from Iran

GHOLAM-HOSSEIN FALLAHI, JAVAD H AHMADIAN, ALI RABBANI*, AZADEH YOUSEFNEZHAD* AND NIMA REZAEI*

*From the Departments of Pediatric Gastroenterology and *Growth and Development Research Center, Pediatrics Center of Excellence, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran.*

Correspondence to: Gholam-Hossein Fallahi, Children's Medical Center Hospital, 62 Qarib St, Keshavarz Blvd, Tehran 14194, Iran. ghfalahi@sina.tums.ac.ir
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Celiac disease has been shown to be associated with type 1 diabetes mellitus. We conducted this study to determine the frequency of celiac disease in a group of Iranian diabetic children. Ninety-six patients with type 1 diabetes mellitus were tested for anti-tissue transglutaminase antibodies. Six patients (6.25%) were seropositive, and histopathological changes were compatible with celiac disease in intestinal biopsy.

Keywords: *Celiac disease, Iran, Type 1 Diabetes Mellitus.*

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Celiac disease (CD) is an immune-mediated entropathy, characterized by hypersensitivity to gliadin consumption(1-3), which could be under-diagnosed in children. A number of studies indicated higher prevalence of CD among patients with type 1 diabetes mellitus (DM1)(2-5). Although there are several studies on CD in Asian countries, especially from India(6-7), the prevalence of CD among DM1 patients is unknown in Iranian children. The prevalence of CD in healthy Iranian subjects and adult patients with DM1 are 0.6% and 2.4%, respectively(8,9). The aim of this study was to determine the frequency of CD in a group of Iranian diabetic children.

METHODS

This project was approved by Ethics Committee of Tehran University of Medical Sciences. We enrolled 96 children with DM1, from our Diabetic Center between December 2006 and January 2007. Written informed consent was obtained from the parents.

Samples of serum were obtained from all subjects and tested for anti-tissue transglutaminase (anti-tTG) antibodies (IgA) using solid phase immunometric assay (ELISA) with Aeskulisa kit (Aesku.lab. Diagnostics, Wendelsheim, Germany). Lower limit for positivity of these antibodies was 20U/mL. Serum IgA was also measured by nephelometry. Children with high anti-tTG ≥20U/mL underwent upper gastrointestinal endoscopy (Gastroscope, Olympus p230) for biopsy from the second part of the duodenum. A histopathologist, blinded to the serology results, examined all biopsy specimens according to modified Marsh criteria (type III-a: hypertrophic crypts and mild villous flattening and type III-b: hypertrophic crypts and marked villous flattening)(10). Anthropometric measurements were taken in all subjects.

Statistical analysis was performed using the SPSS Statistical software, version 14.0. Non-parametric Mann-Whitney test was used to compare body mass index (BMI) and anti-tTG between the two groups. *P* value of less than 0.05 was considered significant.

RESULTS

Ninety-six diabetic children (51 girls, 45 boys, with median age of 12 years) were screened for CD. The median duration of disease was 2 years (range: 1 month-12 years). Among them, 6 patients (6.25%) had positive anti-tTG antibodies (***Table* I**). While none of the diabetic patients with CD has IgA deficiency, one diabetic patient without CD had IgA deficiency. The median anti-tTG in the diabetic patients with CD was 25 (range: 20-30) U/mL, which was significantly higher than 8 (range: 5-18) U/mL in the group without CD ($P<0.001$). Histopathological changes in all 6 cases were compatible with diagnosis of CD. There was not any significant difference on anthropologic data between two groups (median BMI: 17.4, range: 12.9-23.8 in patients with CD *vs.* 19.0, range: 13.6-27.0 in patients without CD, $P=0.69$). While 66.7% of the patients with CD had BMI less than 20, 61.9% of those without CD had BMI<20 ($P=0.59$).

DISCUSSION

CD is associated with a number of autoimmune conditions such as DM1(11), dermatitis herpetiformis, autoimmune hepatitis, thyroiditis and rheumatoid arthritis(4). High prevalence of CD in children with DM1 and occurrence of preventable and treatable complications provide a strong rationale for screening of CD in diabetic patients(2).

The prevalence of 6.2% CD in Iranian diabetic children is much higher than European countries and lower than African countries; it is comparable to few other studies(12-14). However, it should be emphasized that celiac serology may fluctuate in DM1. Initial negative serology does not rule out CD, as almost 40% of patients develop CD a few years after diabetes onset. Similarly transient false positive serology is also known in DM1(5). Although histopathologic changes were compatible with CD in all serology positive cases, false positive serology or latent or potential celiac disease should be considered on some occasions. Thus, the diagnosis of CD should be made on the basis of histology, and not merely on positive serology.

TABLE I CHARACTERISTICS OF SIX DIABETIC CHILDREN WITH CELIAC DISEASE

Age (yrs)	Sex	Body mass	IgA (g/L) index	Anti-tTG (U/mL)	Type*
16	female	23.7	1.4	30	III-a
15	female	23.8	2	25	III-a
12	female	18	1.3	25	III-b
11	female	16.4	2	30	III-a
8	female	12.9	1.6	22	III-a
3	male	16.8	1	20	III-a

**Based on March criteria(10).*

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