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Research Article

Prevalence of the Coeliac Disease among Patients with Type 1 Diabetes Followed Up at the Endocrine Unit in the Lady Ridgeway Hospital for Children Colombo

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Abstract

Prevalence of coeliac disease in type 1 diabetes is approximately 10 times common compared to the general population [1-3]. Most of the children type 1 diabetes with Coeliac disease remained asymptomatic [1,3]. Screening for the coeliac disease in diabetes is a recommended practice, though it is not done in our country due to financial restrictions. We conducted a descriptive cross-sectional study to describe the prevalence of coeliac disease in a cohort of patients with type 1 diabetes attending to the Pediatric endocrine clinic at Lady Ridgeway Hospital Colombo Sri Lanka. Our sample size was 56 patients, aged 1-16 years. Out of them only two were found to have coeliac disease. Thus, the prevalence is 3.5%, and is in the global prevalence range. Further studies are needed recruiting larger population to decide whether routine screening for coeliac disease is beneficial in our children.

Keywords: Type1 Diabetes, Coeliac Disease, Sri Lanka

Introduction

Type 1 Diabetes Mellitus, is an autoimmune disease, with rising trends. The latest International Diabetes Federation estimations showed 542,000 children worldwide are having type 1 diabetes mellitus (T1DM) [1]. There are 86,000 new cases diagnosed each year [1], reflecting an annual increase in the incidence of 3% [1]. Coeliac disease (CD) is an autoimmune condition commonly encountered with T1DM [2]. Its prevalence in type 1 diabetic children ranges from 1-11% in the world [3] Interestingly, most of the children remained asymptomatic and dietary measures improved the CD disease in these children leading to a better glycemic control [2,3] The diagnosis is aided by serological tests that measure Antigliadin (AGA), Antireticulin (ARA), Antiendomysial (AEA), and Anttissue transglutaminase (AtTG) [4]. The biopsy of small intestine helps in confirmation of the diagnosis in case of low antibody levels [2].

Type 1 Diabetic children with coeliac disease develop unexplained hypoglycemic episodes [5-16]. Further they are prone to develop diabetic retinopathy and microalbuminuria earlier [16] although the exact mechanism is not described. In Asia, similar to the global trend, prevalence of Diabetes is rising in the children. However, there are no sufficient epidemiological data available in most countries [3,5] including Sri Lanka. Prevalence of CD is also not described and it is assumed to be low. Hence a routine screening for coeliac disease is not conducted in patients with T1DM. Financial restrictions are an additional barrier in this entity. The aim of the study is to determine the prevalence of patients with CD in a cohort of patients with T1DM and to evaluate whether the routine screening for CD is justifiable.

Methodology

This is a descriptive cross-sectional study, conducted in February 2021 over a month period in the Pediatric Endocrinology Clinic at the Lady Ridgeway Hospital Colombo. Ethical approval was obtained from the ethical committee at the Sri Lanka College of Paediatricians. Study population was serologically confirmed type 1 diabetes patients aged 1-14 years. Diabetes was diagnosed according to the criteria given in the American Diabetes association (ADA) [16]. Type 1 Diabetes was confirmed by the autoimmune antibody panel for T1DM. In this antibodies are tested for glutamic acid decarboxylase (GAD), tyrosine phosphate like insulinoma antigen 2 antibodies (IAA2), insulin auto antibodies (IA) and beta cell specific zinc transporter 8 autoantibodies. If patient is positive for at least one, T1DM was confirmed [17]. After explaining the objectives of the study, written informed consent was obtained from the subjects or the guardian. Blood was withdrawn for IgA level and tissue transglutaminase Ig A level (tGA) . There were no patients with low Ig A levels in the study group. Sample size was limited to 56 patients due to financial restrictions. Patient were given a random number at the clinic visit and selection was done randomly using random generator available in the internet at calculator.net. Upon selection study population consisted of 29 females and 27 males. The screening for CD was taken as positive when the subjects were positive for tGA with normal Ig A levels. These patients were referred to gastroenterology team for confirmation of the disease via endoscopy and biopsy.

Results

Out of the 56 children only two were found to be positive for coeliac screening. Thus, the calculated prevalence was 3.5%. Ig A transglutaminase antibody level of >800AU/ml and 64AU/ml (normal range <8) were seen in the two children. They did not have any gastrointestinal symptoms related to coeliac disease. Both of them underwent endoscopy and biopsy. The histology reports had evidence suggestive of coeliac disease and were commenced on a gluten free diet.

Discussion

The high prevalence of CD among diabetic patients is explained by the presence of common HLA markers such as HLA B8 and HLA DR39, and the DQB1*0201 in both conditions [5]. In research done in Israel, less than 10% of children with type 1 diabetes, show clinical features of CD [8]. Their small intestinal biopsies showed villous atrophy. Some studies showed that these children, had poor growth, short stature, delayed puberty, elevated transaminase levels, iron deficiency anemia, dental enamel defects, arthralgia, hypoglycemia, and a reduction of insulin requirement [7-10]. These symptoms improved with a gluten free diet (GFD) [7]. Further the number of hypoglycemic episodes was reduced [7].

In some instances, diagnosis of CD was delayed due to the presence of diabetes and its management [6]. In some studies, effects of the disease had been identified retrospectively after interventions with a GFD [7]. Thus, the recommendation by ADA is to screen for CD in children with T1DM at diagnosis and at 2 years and five years after the diagnosis [16]. At present the prevalence of CD in children with T1DM is 4.5% (0.97–16.4%) in the globe [12]. Study performed in western India on the prevalence of CD in children with T1DM in 2011 to 2013 period revealed 9.37% [3]. The mean age at which the diagnosis of diabetes made was 9.34 ± 7.3 years [3]. Only 4.1% of patients were found to have CD prior to the diagnosis of T1DM. Sri Lanka is a South Asian country with a population of multiple sociocultural groups where consanguinity and food patterns varies widely. Though the staple diet is rice based, most of the available food products are contaminated with wheat [13]. Over the past decades introduction of westernized food sources have further changed the food habits [12]. Though we do not have an inbuilt data base of patients with diabetes, the trends were not different from the global status. In this scenario we were interested to evaluate the burden of CD in our patients as we do not screen them as a routine.

In this study, the prevalence of CD in children with T1DM was 3.5% which is in the range of the global figure of 1-11%, but it is less compared to India. However, the major drawback in our study was the limited sample size due to financial restrictions as tGA testing is not available in the government sector. In CD, adherence to GFD is highly recommended. Gluten free diet is a challenge in our set up as people are less aware of the disease as well as the gluten free food items, most of the food labels do not comment on the presence of gluten as CD is not considered a health issue in Sri Lanka. Adherence to therapy is highly based on the knowledge, commitment and availability of food sources. Patient support groups are important in educating people about the disease and the remedy. The food pattern in the family needs to be changed to a gluten free diet which may include rice, maize, barley, grain, potatoes and yams.

Conclusion

The prevalence of CD in a cohort of children with T1DM followed up at a tertiary care unit in Sri Lanka is 3.5%. It is in the range of global prevalence rate. The routine screening for the disease among patients with type 1 diabetes is justifiable. However, further studies are required to evaluate its variability in relation to sociodemographic factors and the clinical manifestations upon diagnosis.

Conflicts of interest: No any

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