🔓 OPEN ACCESS

Pediatric

Prevalence of Celiac Disease in Type 1 Diabetes Mellitus among the Pediatric Age Group at Prince Hamza Hospital, a Retrospective Data Analysis and Literature Review

Esraa M Shatnawi MD[*], Salim Masadeh MD, Wafa' Shatnawi MD, Ahmad Shatnawi MD, Noor M Masadeh MD

Pediatric Endocrinologist, Department of Pediatric, Jordan Ministry of Health, Prince Hamza Hospital, Amman Jordan

*Corresponding author: Esraa M Shatnawi
Pediatric Endocrinologist, Department of Pediatric, Jordan Ministry of Health, Prince Hamza Hospital, Amman Jordan

Abstract	Original Research Article

As the relationship of celiac disease (CD) and many other autoimmune diseases is well recognizing and multiple previous studies talks about the importance of early detection and control. We tried to collect the data and analyses the prevalence of Celiac Disease and Diabetes Mellitus (DM) type 1 for our patients (who have a regular visit on the endocrine unit at Prince Hamza tertiary hospital).
Keywords: Celiac disease, diabetes mellitus, bowel enteropathy.

INTRODUCTION

Diabetes mellitus (DM) is one of the most common endocrine disease in Jordan CD is one of the associated autoimmune conditions with diabetes mellitus which characterized by proximal small bowel enteropathy and needs restricted gluten free diet. Here, we tried to put our thumb and accurately knows the prevalence of this disease at our unit.

MATERIAL AND METHODOLOGY

All the patients who have DM type 1 and have a regular follow up profile were enrolled in this study. As a legal rule, our study was approved from the ethical approval unit at our hospital beside illustrating the importance of this study for the patients and have a formal consent form. We filter our patients as a diagnosed cases of CD according to a well-known step. Firstly, a venous blood samples were obtained and sent for laboratory analysis, coagulated then centrifuged and stored at -80 c. an IgA (ELISA) and human anti-tissue transglutaminase antibody (Anti-tTG) IgA were performed. accordingly, (Anti Ttg) IgA antibody level above 20 he second Unit/ml was involved in the second step upper GIT endoscopy and multiple biopsies usually (2-3) from the duodenum were taken for pathologic evaluation immunohistochemistry of the leukocyte common antigen. Counting more than 30 intraepithelial lymphocytes beside 100 epithelial cells as detected by LCA was considered positive and enrolled in our study.

RESULT

The total number of patient included was 255 patients (girls n=111; boys n=144).The age group (4-15) year. With median age 8.4 years by concluding the positive patient who illustrated by the methodology before, there was only 26 positive cases (girls n=16, boys n =10). with an overall prevalence 10.1%.

DISCUSSION

The relation and association of CD and type 1 DM has been studied from a long time. Most of them conclude that there is an increase incidence and prevalence of CD among all pediatric age groups in conjunction with DM type 1 [1]. CD and DM type 1 are an autoimmune disease as a result from multiple factors as environmental, immunologic and genetic factors. However , the is no definite genetic factors detected for both of them .Nowadays, the most popular theory is that there is strong HLA as a common genetic mechanism of this pathogenesis.DQ1 and DQ8 are carrying the highest risk of DM type 1 90% and 10% for CD [2]. Previously, CD was rare as the early detection of these diseases based on clinical manifestation. Later on, upon screening programs multiple silent cases were detected [2]. For which multiple debate was discussed about the

screening and early detection of CD to prevent it's future morbidity and mortality [3]. On the other hand, is it worthy to manage the silent cases as a risk factor and treat it as well? [4, 5]. Regarding the best tool of diagnosing accuracy most of them conclude that anti-endomysial antibody (AAE) and human anti-tissue transglutaminase antibody (anti-tTG) are best in compare to others especially when combined together [6, 7].

Barera *et al.*, documented a higher incidence of positive AAE antibody among type 1 DM (16.4%) while (anti tTG) was 5-10%. In addition to 75% positive cd of cases [8, 9].

Upon our study, we conclude that the incidence of CD with DM type 1 is 10.1% with mean age group is 8.4 years and higher percentage of female rather than males. However, multiple studies were performed worldwide with varying result of sex dominance either female [10, 11] or male [12-14] a large study was held in Jordan before also conclude that the prevalence between the two disease is 9.1% half of them was diagnosed during the screening program at the diagnose of DM type 1.23% with borderline elevation of (anti tTG) IgA who was asymptomatic [15].

CONCLUSION

The association between CD and DM type 1 is significant. Early detection and monitoring is the corner stone of treatment. Similar presentation of diabetic enteropathy and DKA make it worthy to ask for the serology test and intestinal biopsy.

REFERENCES

1. Endocrinologista pediatra, Instituto Materno-Infantil de Pernambuco (IMIP) e Hospital das Clínicas, Recife, PE, Brasil. Mestre, Universidade Federal de Pernambuco (UFPE), Recife, PE, Brasil.
2. Professora adjunta, UFPE, Recife, PE, Brasil. Doutora, Universidade Federal de São Paulo - Escola Paulista de Medicina (UNIFESP-EPM), São Paulo, SP, Brasil
3. West, J., Logan, R. F., Smith, C. J., Hubbard, R. B., & Card, T. R. (2004). Malignancy and mortality in people with coeliac disease: population based cohort study. *Bmj*, *329*(7468), 716-719.
4. Schober, E., Rami, B., Granditsch, G., & Crone, J. (2002). Coeliac disease in children and adolescents with type 1 diabetes mellitus: to screen or not, to treat or not?. *Hormone Research in Paediatrics*, *57*(Suppl. 1), 97-100.
5. Carroccio, A., Vitale, G., Di Prima, L., Chifari, N., Napoli, S., La Russa, C., ... & Notarbartolo, A. (2002). Comparison of anti-transglutaminase ELISAs and an anti-endomysial antibody assay in the diagnosis of celiac disease: a prospective study. *Clinical chemistry*, *48*(9), 1546-1550.
6. Carroccio, A., Vitale, G., Di Prima, L., Chifari, N., Napoli, S., La Russa, C., ... & Notarbartolo, A. (2002). Comparison of anti-transglutaminase ELISAs and an anti-endomysial antibody assay in the diagnosis of celiac disease: a prospective study. *Clinical chemistry*, *48*(9), 1546-1550.
7. Kordonouri, O., Dieterich, W., Schuppan, D., Weber, G., Müller, C., Sarioglu, N., ... & Danne, T. (2000). Autoantibodies to tissue transglutaminase are sensitive serological parameters for detecting silent coeliac disease in patients with type 1 diabetes mellitus. *Diabetic medicine*, *17*(6), 441-444.
8. Bao, F., Yu, L., Babu, S., Wang, T., Hoffenberg, E. J., Rewers, M., & Eisenbarth, G. S. (1999). One third of HLA DQ2 homozygous patients with type 1 diabetes express celiac disease-associated transglutaminase autoantibodies. *Journal of autoimmunity*, *13*(1), 143-148.
9. Barker, J. M., & Liu, E. (2008). Celiac disease: pathophysiology, clinical manifestations, and associated autoimmune conditions. *Advances in pediatrics*, *55*(1), 349-365.
10. Cerutti, F., Bruno, G., Chiarelli, F., Lorini, R., Meschi, F., Sacchetti, C., & Diabetes Study Group of Italian Society of Pediatric Endocrinology and Diabetology. (2004). Younger age at onset and sex predict celiac disease in children and adolescents with type 1 diabetes: an Italian multicenter study. *Diabetes care*, *27*(6), 1294-1298. (https://doi.org/10.2337/diacare.27.6.1294)
11. Poulain, C., Johanet, C., Delcroix, C., Lévy-Marchal, C., & Tubiana-Rufi, N. (2007). Prevalence and clinical features of celiac disease in 950 children with type 1 diabetes in France. *Diabetes & metabolism*, *33*(6), 453-458. (https://doi.org/10.1016/j.diabet.2007.06.004)
12. Larsson, K., Carlsson, A., Cederwall, E., Jönsson, B., Neiderud, J., Jonsson, B., ... & Skåne Study Group. (2008). Annual screening detects celiac disease in children with type 1 diabetes. *Pediatric diabetes*, *9*(4pt2), 354-359. (https://doi.org/10.1111/j.1399- 5448.2008.00367.x)
13. Uibo, O., Heilman, K., Rägo, T., Shor, R., Paal, M., Metsküla, K., ... & Uibo, R. (2010). Symptomless celiac disease in type 1 diabetes: 12-year experience in Estonia. *Pediatrics International*, *52*(2), 230-233. (https://doi.org/10.1111/j.1442-200X.2009.02955.x
14. Crone, J., Rami, B., Huber, W. D., Granditsch, G., & Schober, E. (2003). Prevalence of celiac disease and follow-up of EMA in children and adolescents with type 1 diabetes mellitus. *Journal of pediatric gastroenterology and nutrition*, *37*(1), 67-71.
15. file:///C:/Users/HP/Downloads/Prevalence-of-Celiac-disease-and-Celiac-related-antibody-status-in-pediatric-patients-with-type-1-diabetes-in-Jordan.