

Celiac Disease: Pattern and Trend Comparison between Arab and Western Population

Daad Hassan Akbar

Department of Medicine, Faculty of Medicine and Allied Sciences
King Abdulaziz University Hospital, Jeddah, Kingdom of Saudi Arabia

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ABSTRACT

Objectives: The aim of this study is to describe the pattern and trend of celiac disease in an Arab population and to compare the results with those reported in western populations. To the best of our knowledge, there have been no published studies comparing celiac disease in adults to that in children or studying the trend of the disease in Arab populations.

Method: A retrospective study of patients suffering from celiac disease who were admitted to King Abdulaziz University Hospital between January 1989 and April 1999.

Results: During a 10-year period, 26 patients were diagnosed as having celiac disease. Children constitute 38.5% (10 patients) of the patients while 61.5% (16 patients) were adults. The male to female ratio was 1:1.5

in children and 1:1.6 in adults. The median age at presentation for children was 3.03 years (range = 0.1-13) and 31.3 years (range = 14-62) in adults. Clinical manifestations were mainly gastrointestinal in the children and extra-intestinal in the adults. Gastrointestinal lymphoma developed in 6.5% of the adult group. An increase in the number of adult celiac cases was observed over the last ten years, while children showed a decrease frequency.

Conclusion: The pattern and trend of celiac disease in Arab populations is comparable to that of Western populations, apart from better compliance to gluten-free diet and lower frequency of gastrointestinal lymphoma in Arabs.

KEY WORDS: Arabs, celiac disease, pattern, trend

INTRODUCTION

Celiac disease (CD) is a disorder characterized by malabsorption, abnormal small bowel structure and an intolerance to gluten, a protein found in wheat and wheat products^[1]. It can be overt, with classic features of diarrhea, weight loss, and generalized malnutrition; sub-clinical with isolated nutrient deficiency^[2] or silent with only abnormal small intestinal mucosa^[1,3]. The clinical presentation in children differs from that in adults. Clinical presentation is usually intestinal in children and extra-intestinal in adults^[4,5,6]. These symptoms and abnormal mucosa usually improve following the withdrawal of gluten from the diet^[1,7]. Gastrointestinal carcinoma or lymphoma develops in up to 15% of patients with untreated or refractory CD^[8,9]. Recent studies have shown that there is a 3-fold rise in the annual number of cases of adult CD^[10] and a decrease in the number of childhood cases, which tend to present at a later age^[11].

To our knowledge, no studies have been done comparing the incidence of CD in adults to that in children or studying the trend of CD in an Arab population. The aim of our study is to compare

adults and children diagnosed as having CD at King Abdulaziz University Hospital (K.A.U.H), Jeddah, Saudi Arabia, over the last ten years. A retrospective analysis of the clinical presentation, course, compliance, response to a gluten-free diet, outcome, and complications was undertaken to study the trend of CD in this Arab population and to compare our results with those reported from western countries.

METHOD

In this retrospective study, the histological archives for all CD patients admitted from January 1989 to April 1999 to the K.A.U.H Histopathology Department were retrieved and analyzed. Duodenal and jejunal histology sections were reviewed. Those showing abnormal histology consistent with CD (i.e. complete loss of villi with flattening of the mucosa, hypertrophied crypts with lymphocytic infiltration and reduction of goblet cells, dense infiltration of lamina propria with lymphocyte and plasma cells) were identified. The patients' notes were also reviewed. The diagnostic criteria used for CD were evidence of malabsorption, abnormal histology consistent with

Address correspondence to:

Dr. Daad H. Akbar, FRCP (UK), Asst. Professor/Consultant Physician, P.O. Box 18298, Jeddah 21415, Kingdom of Saudi Arabia. Tel. (9662) 6557043 / 6586516; fax. (9662) 6541626; e mail: dnadakb@yahoo.com

CD, and clinical improvement following a gluten-free diet.

Detailed information for every patient was obtained regarding age and clinical features on presentation; duration of symptoms before diagnosis; associated diseases, such as dermatitis herpetiformis, diabetes mellitus, thyroid disorders, primary biliary cirrhosis, chronic active hepatitis and sclerosing cholangitis; relevant investigations on presentation, such as complete blood count (CBC), liver transaminases, serum albumin, thrombin time and partial thromboplastin time (PT, PTT), serum calcium, phosphate and alkaline phosphatase, antigliadin antibodies, and thyroid function tests (TFT); course of the disease; compliance and response to a gluten-free diet; repeated intestinal biopsy; development of intestinal lymphoma; use of steroids; and outcome. Patients were divided into two groups. Those who were 14-years-old and above were considered as adults, and those below 14 years were considered children. The study period was divided into two sub-periods of five years each (from 1989 to 1993 and from 1994 to 1999).

Statistical Analysis:

An analysis of data was conducted using the Statistical Package for Social Sciences (SPSS 7.5). A two-tailed student's test and Chi-square test were used as appropriate. Results were considered significant if the P value was less than 0.05.

RESULTS

From a total of 1117 duodenal and jejunal biopsy specimens, 29 biopsy specimens from 26 patients were identified for further study. The overall incidence was 25/1000 and the mean incidence was 2/1000 per year. Of the total patients studied, ten (38.5%) were children and 16 (61.5%) were adults. The male to female ratio was 1:2.7. Table 1 illustrates the comparison between adults and children regarding the clinical presentations, laboratory investigations and complications. Anemia presented as the only manifestation of CD in two (12.6%) adults. No associated dermatitis herpetiformis, diabetes mellitus, thyroid or chronic liver diseases were found in either of the two groups. Antigliadin IgG antibodies were studied in four children (40%) and was found to be high in all cases. When the same antibody screening was done for one adult (6.3%), it was found to be high. TFT was done in one-child (10%) and six adults (37.5%). All had normal results. Skeletal X-rays of patients with low serum calcium showed Looser's zones in one adult (6.3%). All abnormal laboratory levels returned to normal following the initiation of a gluten-free diet. The trend of the clinical manifestations over the last ten

years shows a tendency of adults to present with extra-intestinal manifestations while children showed less tendency to extra-intestinal manifestations and more towards intestinal presentations, as shown in Table 2.

Table 1

Comparison between adults and children during the whole study period according to some variables:

Variables	Adults N = 16 N (%)	Children N = 10 N (%)	P value S < 0.05
Mean Age (years)	31.13	3.03	
Sex (M:F)	1:1.6	1:1.5	NS
Mean duration before diagnosis	3.8 y	8 m	S
Diarrhea	8 (50)	9 (90)	S
Constipation	1 (6.3)	1 (10)	NS
Abdominal pain	9 (56.3)	1 (10)	S
Abdominal distention	1 (6.3)	5 (50)	S
Vomiting	4 (25)	6 (60)	S
Weight loss	11 (68.8)	9 (90)	NS
Failure to thrive		3 (30)	
Short stature	2 (12.5)	5 (50)	S
Generalized fatigability	7 (43.8)	1 (10)	S
Bone ache	5 (31)		
Osteomalasia	10 (62.5)		
Carpopedal spasm	3 (19)		
Atopic dermatitis	2 (12.5)		
Low hemoglobin	13 (81)	4 (40)	S
Elevated liver transaminases & low albumin	3 (19)	3 (30)	NS
Prolonged PT & PTT	3 (19)	5 (50)	NS
Intestinal lymphoma	1 (6.3)		

PT = prothrombin time, PTT = partial thromboplastin time

Table 2

Comparison between adults and children before and after 1994 according to some variables.

Variable	Adult N = 16		Children N = 10	
	Before 1994 N = 2	After 1994 N = 14	Before 1994 N = 6	After 1994 N = 4
Age (years)	36	30.5	4	2
Sex (M:F)	0:2	1:3.7	1:2	1:1
Mean duration of symptoms	9 y	3 y	1 y	4 m
Diarrhea No. (%)	2 (100)	6 (42.9)	6 (100)	3 (75)
Constipation No. (%)		1 (7.1)		1 (25)
Abdominal pain distention No. (%)	2 (100)	7 (50)	1 (16.7)	
Abdominal No. (%)		1 (7.1)	3 (50)	2 (50)
Vomiting No. (%)	1 (50)	3 (21.4)	3 (50)	3 (75)
Weight loss No. (%)	2 (100)	9 (64.3)	6 (100)	3 (75)
Low hemoglobin No. (%)	1 (50)	12 (85.7)	3 (50)	1 (25)
Low calcium No. (%)	1 (50)	9 (62.5)		

Over a follow-up period ranging from eight months to six years, 11 adults (69.3%) were compliant and showed clinical and laboratory improvement on the gluten-free diet. Of the remaining five patients with poor compliance, one used steroids for atopic dermatitis and showed rapid recovery while the others had fluctuation of symptoms depending on their gluten restriction. Only one adult patient underwent a repeat biopsy after one year, which showed complete recovery of the intestinal mucosal abnormalities. Poor compliance to a gluten-free diet with accompanying fluctuations of symptoms was seen in three of the children (30%) while the remaining seven children (70%) showed good compliance, and had clinical and laboratory improvements on gluten restriction. There was a family history of CD in three children, each of who had sisters with the same disease and one of them had also a cousin with CD.

DISCUSSION

CD is a genetic immunologically-mediated small bowel enteropathy that causes malabsorption^[12]. It is rare to almost nonexistent in Asians as compared to Europeans^[8,9]. This could be explained by the differences in eating habits. The typical Asian diet concentrates mainly on rice, which is low in gluten, as opposed to the typical European diet which is filled with gluten-rich foods. The incidence, however, increases if these genetically predisposed individuals live in a high prevalence country and change their eating habit, as reported by Sherks, et al^[13].

While in Europe, recent studies have reported a new prevalence of 1:200 to 1:400^[3,7], the prevalence in the Arab population is not known. There have been occasional reports on children^[14,15,16,17] and adults^[5] from different Arab countries.

The age of children at presentation and female predominance was comparable to that reported in other Arab and European countries^[11,14,15,16]. The delay in presentation has been attributed to prolonged breast feeding and late introduction of cereals found in our society^[14,18]. Adults in our study also presented at a younger age group than those reported in other series with less female predominance^[5,19]. Clinical presentation between the adults and children in our study also differed. The preponderance for adults to present with extra-intestinal manifestations and children with gastrointestinal manifestations has been observed in our patients and reported by others^[4,5]. Anemia as the only presentation of CD^[20,21], has been observed in 12.6% of our adult group.

Although atopic dermatitis was reported to be associated with CD in children^[23], none of the children in our study were affected, while two

adults (12.5%) have associated atopic dermatitis. Atopy has been reported to be associated with celiac disease^[6].

The delay between presentation and diagnosis, which is noticed more in adults, was reported before^[24] and it could be attributed to the sub-clinical type of presentation in adults. Although the clinical signs, symptoms and malabsorption associated with CD are reversible once gluten is removed from the diet^[7], compliance to a gluten-free diet is difficult^[25]. Approximately 70% of our patients (adults and children) were compliant, which is a higher percentage than that reported by Kumar, et al., who found only 44% of patients maintained a strict diet despite the physicians' repeated recommendations^[25]. This better compliance, which was observed in our population, could be explained by the ability of the patients to stick to the typical type of Arab foods (rice, meat and milk) which are low in gluten content and easy for the patients to follow.

Gastrointestinal lymphoma was reported in 6.3% which is less than that reported in other series^[8,9]. This could be explained by the better compliance and the lower number of untreated cases. The incidence of CD in siblings appears to be many times higher than in the general population^[11] and this has been shown in our patients where three children gave a family history of CD in their sisters.

It has been reported by Gumaa et al., that CD in childhood is decreasing and it is presenting at a later age^[11]. This finding is similar to ours. This declining incidence was explained by the changing infant feeding practice characterized by the latter introduction of dietary gluten, increased use of baby rice and gluten-free foods for weaning and an increased incidence of initial breast feeding^[26]. The increase in the number of adults with CD over the last ten years that we have observed has also been observed in the western countries^[3,10,27]. Researchers contribute increase to improved diagnostic methods and techniques available today as well as to a greater awareness of the disease. In our population, we can also attribute this increase to the changing eating habits and the westernized type of food which contains a higher gluten content (e.g. spaghetti, noodles, pizza) that stimulate the immunological response in genetically predisposed individuals compared to the original Arab foods which have a low gluten content (e.g. rice, meat and milk). Over the last ten years, adult patients have shown an increasing sub-clinical type of presentation rather than the classic type and this has been observed in the western countries also^[4,6]. Whether this type of presentation is attributed to earlier diagnosis and the recognition of silent and

latent disease as suggested by Parnell et al.,^[26] or there are other unidentified factors that could lead to selected malabsorption, is a subject that needs further study.

In conclusion, we found that the pattern of CD in Arabs is comparable to that in the western countries. We noticed better compliance with gluten-free diets in our patients, which might be attributed to the lower gluten content of the original Arab foods. CD with sub-clinical type of presentation in Arabs is increasing the same as observed in the western countries. In addition to more awareness of the disease and better diagnostic techniques, this can be explained by changing eating habits and shifting to the westernized type of food with higher gluten content. Further studies with a larger sample size are needed to further study CD in the Arab population.

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