



Awareness of the Public about Celiac Disease in Children in Saudi Arabia

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ABSTRACT

Background: Celiac disease is a chronic immune-mediated enteropathy that affects the small intestine of genetically predisposed individuals and is precipitated by the ingestion of food containing gluten. Treatment consists of a gluten-free diet to control the signs and classic symptoms of the disease and prevent complications. **Objective:** To determine the awareness of the public about celiac disease in children in Saudi Arabia. **Methods:** A cross-sectional community-based study conducted during the period from 1st May to 31st July 2019. A systematic random sampling technique was used. The study included 1619 participants. Data collected using a pre-designed online questionnaire distributed among parents of children and adolescents. The questionnaire includes about 18 items that guide us to the awareness of the public about celiac disease in children. **Results:** Half of participants (50.1%) think that Celiac diseases are a form of allergy to wheat products. Less than half (46.7%) of cases think that there is a correlation between the presence of celiac and disease and other immunological diseases and 33.7% don't know. The majority of participants 59.9% think that family history has a role in the occurrence of celiac diseases and 62.4% think that it affects humans at any age. Only 28.8% of participants think that celiac disease is more prevalent in the Middle East than in any other region and the majority 49.8% don't know. The majority (35.2%) of participants don't know if there was a relation between cough and asthma with celiac disease. About third (31.6%) of the participants agreed that CD is linked to diabetes and 26.3% think that the CD associated with genetic diabetes than acquired diabetes. More than half of participants 51.5% think that psychological disorders are among the causes of celiac disease but, 39% of them don't think that pregnancy and childbirth are among the causes of CD and 40.6% don't know if surgical operations are among the causes or not. The majority of participants 59% think that CD is treatable disease, and 49.7% think that a patient with CD should have food that is completely free of wheat and its products. More than half (52.3%) participants think that colon cancer is one of the consequences of CD. **Conclusion:** The general population of Saudi Arabia, has reasonable knowledge about celiac diseases in children. We recommend health education sittings to raise the awareness of the public about the disease.

Keywords: Awareness, Public, Celiac disease, Children, Saudi Arabia

INTRODUCTION

Celiac disease (CD) is a multifactorial immune-mediated disorder, triggered by the ingestion of gluten and other

gluten-related proteins in genetically predisposed subjects and it is the most common food-related chronic disease in children [1,2]. It is also known as gluten-sensitive enteropathy, celiac sprue, and non-tropical sprue, all terms that identify the injury to the lining of the small intestine [3]. Celiac disease involves the inability of the small intestine to digest gluten, which is found in many grains such as wheat, barley, rye, buckwheat, or millet [4]. Celiac disease (CD) is a condition that causes a variety of symptoms, mostly affecting the gastrointestinal tract, such as diarrhea, weight loss, bloating, stomach pain, and a lack of appetite [3].

For babies, CD symptoms may initially appear after a baby is first given cereal containing gluten. Symptoms may include irritability, poor weight gain, or even loss of weight. Common symptoms for children and adolescents may include chronic diarrhea, although some patients are constipated. Some children may vomit, complain of abdominal pain or distension, or have pale or foul-smelling stools. Symptoms of CD can arise at any age; the older the child is at symptom onset, the more likely it is for the symptoms to be unusual and include symptoms other than those related to the gastrointestinal tract. These may include fatigue, iron-deficiency anemia, or dental problems [4]. Some children get a rash called dermatitis herpetiformis, which involves itchy blisters mostly on the outer surfaces of the elbows, knees, and buttocks [5].

In addition to the gastrointestinal system, the CD can also involve other body systems and cause conditions including short stature, osteoporosis, and iron-deficiency anemia. It develops in people who are genetically predisposed to having an immune system that reacts to gluten in the diet and are exposed to gluten [4]. CD is a lifelong disorder, requiring dietary treatment. The only treatment of CD is complete and lifelong avoidance of foods containing gluten including cereals, kinds of pasta, breads, and other baked goods. Families need to also monitor other foods, such as canned soups and stews that may be thickened with grains. Even small amounts of gluten can cause symptoms. It is associated with a number of complications and comorbidities, including excess mortality [6].

Celiac disease is a major public health problem worldwide. The pooled global prevalence of celiac disease was 1.4%. The pooled global prevalence of biopsy-confirmed celiac disease was 0.7%. The prevalence values for celiac disease were 0.4% in South America, 0.5% in Africa and North America, 0.6% in Asia, and 0.8% in Europe and Oceania; the prevalence was the prevalence of celiac disease was significantly greater in children than adults, higher in female vs male individuals [7]. In the United States, an estimated 3 to 13 per 1000 people have CD. Some research studies suggest that although CD is likely to present in about 1% of people, only about 10% to 15% of those know they have it and are being treated [4].

Although there is a lot of research about celiac disease in children nationally and internationally, up to our knowledge, no previous studies about the public knowledge about nature, causes of the disease, its manifestations and complications carried out in Saudi Arabia especially in Riyadh region.

This study aimed to determine the awareness of the public about celiac disease in children in Saudi Arabia.

PARTICIPANTS AND METHODS

A cross-sectional study was conducted in Saudi Arabia, during the period from 1st May to 31st July 2019. The sample size was calculated using the sample size equation: $n = z^2 p(1-p)/e^2$. A systematic random sampling technique was used; we included parents of every 10th family using pre-designed online questionnaire distributed among parents of children and adolescents.

Study Procedure

Data was collected through a predesigned online disseminated questionnaire including all the relevant questions to fulfill the study objectives. The questionnaire consists of questions about the age, gender marital status and educational level of the respondent and questions about 18 items that guide us to the awareness of the public about celiac disease in children.

Administrative and Ethical Considerations

The study objectives were briefly explained and informed verbal consent was obtained in a special section of the questionnaire. Confidentiality was maintained as no names were mentioned in the questionnaire.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics for Windows version 20.0. Quantitative data were expressed as means \pm standard deviation, median, and range. Qualitative data were expressed as number and percentage. Percentages and frequencies were used to describe the demographic profile of the respondents. Then it is also used to describe the answers to the questions that guide us about the awareness about autism.

RESULTS

Table 1 illustrates the distribution of the studied participants by sociodemographic and disease-related criteria. Mean age (\pm S.D) was 28.68 ± 9.53 , 59.2% were females, 60% were single, 37% married and most (84.2%) had university or more education.

Table 1 Distribution of the studied participants by sociodemographic and disease related criteria (No.=1619)

Characteristics	Summary Statistics
Age	
Mean \pm SD	28.68 \pm 9.53
Median (Range)	26 (4-99)
Gender	
Female	959 (59.2%)
Male	660 (40.8%)
Marital status	
Widow	49 (3%)
Single	971 (60%)
Married	599 (37%)
Education	
Illiterate	9 (0.6%)
Primary	9 (0.6%)
Secondary	214 (13.2%)
Intermediate education	23 (1.4%)
University or more	1364 (84.2%)

Table 2 illustrates the distribution of the studied participants by awareness about celiac disease in children. It is clear from the table that, half of the participants (50.1%) think that Celiac disease is a form of allergy to wheat products. Less than half (46.7%) of cases think that there is a correlation between the presence of celiac and disease and other immunological diseases and 33.7% don't know. The majority of participants 59.9% think that family history has a role in the occurrence of celiac diseases and 62.4% think that it affects humans at any age. Only 28.8% of participants think that celiac disease is more prevalent in the Middle East than in any other region and the majority 49.8% don't know. The majority (35.2%) of participants don't know if there was a relation between cough and asthma with celiac disease. About third (31.6%) of the participants agreed that CD is linked to diabetes and 26.3% think that the CD associated with genetic diabetes than acquired diabetes. More than half of participants 51.5% think that psychological disorders are among the causes of celiac disease but, 39% of them don't think that pregnancy and childbirth are among the causes of CD and 40.6% don't know if surgical operations are among the causes or not. The majority of participants 59% think that CD is treatable disease, and 49.7% think that a patient with CD should have food that is completely free of wheat and its products. More than half (52.3%) participants think that colon cancer is one of the consequences of CD.

Table 2 Distribution of the studied participants by awareness about celiac disease in children (No.=1619)

Characteristics	No	I don't know	Yes
	N (%)	N (%)	N (%)
Do you think that gastrointestinal disorders are a form of allergy to wheat products?	248 (15.3%)	560 (34.6%)	811 (50.1%)
Do you think there is a correlation between the presence of celiac disease and other immunological diseases?	318 (19.6%)	545 (33.7%)	756 (46.7%)
Do you think that family history has a role in the occurrence of celiac disease?	276 (17.1%)	373 (23.0%)	970 (59.9%)
Do you think that celiac disease affects humans at any age?	242 (14.9%)	367 (22.7%)	1010 (62.4%)

Do you think that celiac disease in children is more prevalent in the Middle East than in any other region?	346 (21.4%)	807 (49.8%)	466 (28.8%)
Do you think that bleeding from the anus is not considered one of the most important symptoms of celiac disease in children?	614 (37.9%)	658 (40.6%)	347 (21.5%)
Do you think that cough is not related to celiac disease in children?	475 (29.3%)	583 (36.0%)	561 (34.7%)
Do you think that asthma is not related to celiac disease in children?	511 (31.6%)	570 (35.2%)	538 (33.2%)
Do you think celiac disease in children is linked to diabetes?	540 (33.3%)	568 (35.1%)	511 (31.6%)
Do you think that the celiac disease in children is associated with genetic diabetes than acquired diabetes?	393 (24.3%)	800 (49.4%)	426 (26.3%)
Do you think colon cancer is one of the consequences of celiac disease?	215 (13.3%)	557 (34.4%)	847 (52.3%)
Do you think visiting a doctor is necessary to diagnose celiac disease in children?	93 (5.7%)	251 (15.5%)	1275 (78.8%)
Do you think GI diseases are treatable diseases?	276 (17%)	388 (24.0%)	955 (59.0%)
Do you think that a child with celiac disease should have food that is completely free of wheat and its products?	294 (18.2%)	520 (32.1%)	805 (49.7%)
Do you think that psychological disorders are among the causes of celiac disease in children?	304 (18.8%)	481 (29.7%)	834 (51.5%)
Do you think surgical operations are among the causes of celiac disease in children?	590 (36.5%)	658 (40.6%)	371 (22.9%)
Do you think pregnancy and childbirth are among the causes of celiac disease in children?	632 (39.0%)	617 (38.1%)	370 (22.9%)
Do you think celiac disease in children is a serious problem?	556 (34.3%)	487 (30.1%)	576 (35.6%)

DISCUSSION

Celiac disease is a chronic immune-mediated enteropathy that affects the small intestine of genetically predisposed individuals and is precipitated by the ingestion of food containing gluten. Treatment consists of a gluten-free diet to control the signs and classic symptoms of the disease and prevent the onset of malign neoplasias [1,2]. This is a cross-sectional study was conducted among 1619 of the studied patients. The study aimed to determine the awareness of the public about celiac disease in children in Saudi Arabia. Celiac disease is an inflammatory disorder with autoimmune features, triggered in genetically susceptible individuals by exposure to dietary wheat and related prolamines from rye and barley [8].

According to this, our study reported that half of participants (50.1%) think that Celiac diseases are a form of allergy to wheat products. Upon exposure to gluten, which found in wheat an abnormal immune response may lead to the production of several different autoantibodies that can affect a number of different organs [9]. In the small intestine, this leads to an inflammatory reaction and may produce shortening of the villi lining the small intestine (villous atrophy) which affects the absorption of nutrients, frequently leading to anemia [10,11]. The risk of developing other autoimmune diseases is 5-10 times higher in the CD population [12]. Celiac disease is also associated with several other disorders of childhood, including type 1 diabetes mellitus, autoimmune thyroiditis, Down syndrome, Turner syndrome, and selective immunoglobulin A (IgA) deficiency [13]. Our study found that 46.7% of participants think that there is a correlation between the presence of celiac and disease and other immunological diseases, and 33.7% don't know. Although it is controversial, some investigators suggest that the early diagnosis and treatment of celiac disease may prevent the occurrence of autoimmune disorders that are associated with celiac disease, such as diabetes and thyroiditis [14,15].

Our study reported that the majority of participants 59.9% think that family history has a role in the occurrence of celiac diseases and 62.4% think that it affects humans at any age. In accordance with our results, another study showed that CD is a familial disorder: first-degree relatives of CD patients have an increased risk of 5 to 10% of developing the disease [16]. Most countries, therefore, recommend screening of first-degree relatives. It has gradually become clear that the prevalence of CD in different countries in the Middle East, North Africa, and India where wheat has been the major staple food for many centuries is almost the same as that in Western countries [17].

In this study, we found that only 28.8% of participants think that celiac disease is more prevalent in the Middle East than in any other region and the majority 49.8% don't know. A link between CD and asthma has been supported by some studies but not by others. Our study found that the majority of participants don't know if there was a relation between cough and asthma with celiac disease. Greco and coworkers found no difference in the prevalence of atopy in cases affected by CD and their relatives compared with controls and their relatives [18]. On the other hand, an important study on the Finnish Medical Birth Register data of the whole 1987 birth cohort showed a significant

increased cumulative incidence of asthma in children with CD (24.6%) than in children without CD (3.4%) during the first 7 years of life [19].

A clinical association between celiac disease (CD) and type 1 diabetes mellitus (DM1) has largely been recognized [20]. Our study reported; 31.6% of participants agreed that CD is linked to diabetes and 26.3% think that the CD associated with genetic diabetes than acquired diabetes. It is now well recognized that CD is associated with diabetes and the prevalence of CD in patients with type 1 diabetes mellitus (T1DM) is higher than in the general population [21].

There are various theories as to what determines whether a genetically susceptible individual will go on to develop coeliac disease. Major theories include surgery, pregnancy, infection and emotional stress [22]. Our study reported that more than half of participants 51.5% think that psychological disorders are among the causes of celiac disease but, 39% of them don't think that pregnancy and childbirth are among the causes of CD and 40.6% don't know if surgical operations are among the causes or not.

The majority of participants 59% think that CD is a treatable disease, and 49.7% think that a patient with CD should have food that is completely free of wheat and its products. The only known effective treatment for children with celiac disease is a strict lifelong gluten-free diet, which leads to recovery of the intestinal mucosa, improves symptoms and reduces risk of developing complications in most people [23]. If untreated, it may result in cancers such as intestinal lymphoma and a slightly increased risk of early death [24].

In this study, we reported that 52.3% of participants think that colon cancer is one of the consequences of CD. It has been demonstrated that increased awareness and education about celiac disease, as well as better availability of gluten-free foods, helps to improve the child's and family's adjustment to this chronic disease [25,26].

CONCLUSION

The general population of Saudi Arabia has reasonable knowledge about celiac diseases in children. We recommend health education sittings to raise the awareness of the public about the disease.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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