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ORIGINAL ARTICLE

Screening of coeliac disease in undetected adults and patients diagnosed with irritable bowel syndrome in Riyadh, Saudi Arabia

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KEYWORDS

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Abstract The present study is to determine the prevalence and implication of coeliac disease (CD) among adult Saudis and compared to those with diagnosed irritable bowel syndrome. This prospective study was conducted among 980 adults. Out of that, 482 subjects (staff and students of Riyadh Health Science College) were designated as control cohorts for undetected coeliac disease. Furthermore, another contingent of 498 subjects diagnosed with irritable bowel syndrome (IBS) at Prince Salman Hospital and Al-Iman General Hospital also constituted a segment of the overall initial 1020 subjects. Both cases and control were tested for serological markers of coeliac disease (tissues transglutaminase (tTGAs) and endomysial autoantibody (EMAs) and were confirmed by histopathology test. All the positive for cases of coeliac disease were screened for iron deficiency anaemia, Vitamin D deficiency, and osteoporosis and weight assessment. The percentage of coeliac disease in control subjects and patients diagnosed with irritable bowel syndrome (IBS) were found to be 1.9% and 9.6% respectively, about 38% of the total coeliac disease patients are among females of middle age (20–39-years) and 16% of the males in the same age range. Whereas, 20% and 25% of all coeliac disease cases with ages of 40–59 were remarked as females and males respectively. The identical nature and overlap of symptoms of the two conditions could possibly result in misdiagnosis of coeliac diseases or over-diagnosis of irritable bowel syndrome. The findings of the study might also give considerable implications of the disease in the nutritional level which is noticeable.

1. Introduction

It is clinically acknowledged that coeliac disease can be regarded as a potent autoimmune disorder affecting various body systems. Most individuals that are prone to it are those who consume rye, barley and wheat that ultimately produce

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gluten (Green and Cellier, 2007; Sanders et al., 2003; Kolho et al., 1998). During the digestive process, the taking in of gluten can result in morphological changes in the mucosa of the small intestine. It then, as corollary affects the smooth operation of villi, that ultimately results in malabsorption (Sanders and Hurlston, 2002). Coeliac disease is considered as a unique gastrointestinal atrophy, which is mainly associated with children, though; it has now been observed that is no longer age-sensitive (Lohi et al., 2007).

The most notable features of coeliac disease's symptoms include: defective absorption, (malabsorption), anaemia, insufficiency of iron, debilitating diarrhoea and loss of weight (Zipser et al., 2003; Green et al., 2001). It is also noticed that the diminutive body structure is one of the outstanding features of the disease. Furthermore, apart from gastrointestinal symptoms, it is pertinent to say that the disease has certain traits that are even beyond the familiar intestinal disorders. Ailments associated with the disease are those related to body parts such as brain, liver, joints, skin, bone and obstetrics (Chakravarty and Scott, 1992). It is also validated in other studies that type 1 diabetes mellitus, thyroid diseases and certain autoimmune diseases are equally associated with coeliac disease (Ludvigsson et al., 2005).

Irritable bowel syndrome (IBS) is a chronic functional disorder of the gastrointestinal tract of unknown origin. According to previous studies, incidence of IBS differs depending on how a manifestation was described and it was also found that IBS is more common in females and young individuals ranging from 5% to 20% (El-Salhy et al., 2012; Sperber et al., 2005; Boivin, 2001; Spiegel, 2009). Affected individuals mostly experience chronic relapsing-remitting course like symptoms such as lower abdominal pain, diarrhea, and abdominal bloating or distension (Marsh, 1992; Ford et al., 2008; Thompson et al., 1999; Manning et al., 1978). Patients with coeliac disease also reported symptoms like bloating, abdominal pain, and chronic diarrhoea. Coeliac disease and irritable bowel syndrome are conditions that have similar symptoms. Moreover, according to previous studies, individuals who are positive with irritable bowel syndrome are prone to having a coeliac disease compared to controls without irritable bowel disease (Longstreth et al., 2006). In this study, a much broader spectrum of individuals have been investigated for coeliac disease and consequently being diagnosed. This study aims to determine the prevalence and implication of coeliac disease (CD) among adult Saudis and make comparison to those with diagnosed irritable bowel syndrome as there seems to be a sort of diagnostic haziness between CD and IBS. It is to be noted that both IBS and coeliac disease share a lot of similarities in terms of symptoms; hence, coeliac disease should be included in the differentiation exercise of diagnosing patients. On the whole, IBS symptoms often overlap with coeliac disease.

2. Materials and methods

2.1. Subjects and methods

In this study that had been conducted from January 2012 to January 2013, a total of 1020 subjects aged 20–60 were involved. Out of that, 482 subjects (staff and students of Riyadh Health Science College) were designated as control cohorts for undetected coeliac disease. Furthermore, another contingent of 498 subjects diagnosed with irritable bowel syndrome (IBS) at Prince Salman Hospital and Al-Iman General Hospital also constituted a segment of the overall initial 1020 subjects. None of the IBS patients was known have CD. We need to note here that 40 students from the control group had withdrawn from the control cohort, thus leaving us to carry out the study validly on 980 subjects. All respondents answered sets of questionnaires and underwent diagnosis conducted by a physician in accordance with Manning et al. (1978) and Rome III diagnosis criteria (Longstreth et al., 2006). The diagnosis questionnaire included GIT symptoms such as diarrhoea, vomiting, constipation, dyspepsia, abdominal pain or discomfort and indigestion related to food and lactose intolerance. Other data about family and subjects' history included; diabetes mellitus, abdominal operation, anaemia, osteoporosis, autoimmune diseases and even thyroid disorders. In addition to the anthropometric measurements, all students and staff that participated were given a leaflet explaining the purpose of the research, a written consent was signed by each participant and stating that all the names and personal data would be decoded and participation was voluntary. All participants had the right to withdraw at any stage during the study. This study was approved by ethics committee of research of college of health sciences.

2.2. Blood measurements and histopathology evaluation

10 ml of venous blood sample was drawn in vacutainer tubes (Rapid Serum Tubes) without anticoagulant, with 10 min clotting time at room temperature. The blood samples collected were centrifuged at 4000×*g* at 4 °C for 10 min, and then stored at −30 °C in aliquots of 300 µl for the analysis of the immunoglobulin A antibodies against human tissue transglutaminase (tTG). On the whole, serum samples were proved positive for IgA antibodies against human tTG by visual CD-LIA (Imtec-ceoliec disease-LIA, Germany). All Samples testing positive were measured for EMA known as anti-tTG antibody against transglutaminase. These were done using a commercially available enzyme-linked immunosorbent assay (ELISA; Euroimmun, Germany) kit. The anti-tissue transglutaminase IgA ELISA test is an Indirect-solid phase enzyme Assay for the quantitative measurement of IgA antibodies to transglutaminase in serum. Autoimmune ELISA kits were used for diagnostic laboratory procedures carried out according to the manufacturers' instruction for all positive samples.

Biopsy specimens from the second part of the duodenum were taken from all subjects who proved positive for EMA against transglutaminase and antigliadin antibodies (AGA). The procedure includes the following; biopsy specimens were fixed in formalin, embedded in paraffin, sectioned then treated with haematoxylin–eosin stain in accordance with Marsh criteria.

3. Results

A total of 980 patients were screened, of which 55 patients were found to be positive for coeliac disease, 32 were females and 23 males; age ranged between 20 years and 59 years. Among the 482 individuals included in the control group, nine patients were detected with coeliac disease (1.9%) while in the