Original Article

Celiac Disease

# Celiac Disease; A Hidden Cause of Iron Deficiency Anemia?

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## ABSTRACT

**Objective:** The aim of the study is to determine frequency of celiac disease in adults with inexplicable iron deficiency Anemia

**Study Design:** Cross-sectional / observational study

**Place and Duration of Study:** This study was conducted at all Medical units of Civil Hospital Karachi from December 2009 to June 2010.

**Materials and Methods:** The study included diagnosed cases of Iron Deficiency Anemia on basis of Iron profile without evident reason. They were evaluated for celiac disease on the basis of serological markers i.e. tissue transglutaminase antibodies (TTG) IgA type via standard laboratory procedures.

**Results:** A total of 100 patients with Iron deficiency anemia previously diagnosed on basis of serum levels were included in this study. The average age was 37.12+ 8.2years and 44 (44%) were males.

Celiac disease was found via serology in 16 (16%) of the patients. Out of these 16 Celiac disease patients 7 (43.75%) were males and 9 (56.25%) were females with 1:1.28 male to female ratio.

**Conclusion:** Celiac disease is an important cause of inexplicable iron deficiency anemia especially in absence of gastro-intestinal symptoms. Serology though less sensitive, but can be an important screening tool for these patients.

**Key Words:** Iron Deficiency Anemia, Celiac disease, Tissue Transglutaminase antibody IgA.

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## INTRODUCTION

Celiac disease is a condition in which immune system responds abnormally to a gluten, a protein, which then leads to damage to the lining of small intestine. It is also known as gluten-sensitive enteropathy or celiac sprue.[1]

The common symptoms of celiac disease include diarrhea, poor appetite, weight loss or difficulty in gaining weight. These symptoms can occur at any age from infancy to adulthood. It may do not presents with classical symptoms in some people rather presenting with nutritional deficiencies including iron, B12 or /and folate.[2,3] It may manifest with a skin rash called as dermatitis herpetiformis. Celiac disease in adults has variety of symptoms, including typical and atypical features. In atypical features the commonest is iron deficiency anemia.[4]

Iron-deficiency anemia, itself, is a common form of anemia worldwide and despite of scrupulous workup often examination is inconclusive, Celiac disease has been identified as the cause of undeterminable iron deficiency anemia and cause refractory to the iron therapy.[5] Anemia without other clues of intestinal malabsorption is one of the most common extra intestinal manifestations of celiac disease. Anyone who is refractory to iron therapy should be screened for celiac disease. The prevalence of Iron-deficiency anemia in adults, as the only manifestation or the most frequent extra-intestinal signs in Celiac disease is up to 6%.[6,7]

Conventional investigations of iron-deficiency anemia include both gastroscopy and colonoscopy to rule out the possible lesions.[8] However, even with extensive search, >35% of patients remain without a diagnosis.[9] Multiple international studies have shown presence of celiac disease in patients having iron deficiency anemia.[10] Although no such study has been done in Pakistan, but there is a study conducted on iron deficiency anemia, and it showed 5% cases with refractory anemia, and the reason was malabsorption.[11]

As a general rule the management of celiac disease includes education about the disease and lifelong adherence to gluten free diet. Those patients who are refractory to gluten free diet, are the candidates for steroids or other Immunosuppressant medications.

The incidence of Celiac Disease is increasing among certain populations in Africa (Saharawi population), Asia, and the Middle East.[12]Although the true prevalence of celiac disease in Pakistan is not known, it is felt to be a common problem.[13] It is especially common in the Punjab but also present in other

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provinces.[14] These patients often remain undiagnosed due to lack of awareness regarding the versatile presentation of the disease. Iron-deficiency anemia is the most common form of anemia worldwide and has usually been attributed to increase menstrual bleeding and pregnancy-associated requirements in premeno-pausal women and to GI blood loss in men and postmenopausal women.

The aim of our study was to find out the proportions of celiac disease so that early diagnosis and management can be planned in these patients and local data on this issue may help us to device strategies as per our circumstances.

## MATERIALS AND METHODS

This cross sectional study was conducted in Medical units of Civil Hospital Karachi from December 2009 to June 2010.

All previously diagnosed cased of iron deficiency anemia aged between 12 to 60 years were included in the study and informed consent was obtained from all the subjects. Iron deficiency anemia was proven on basis of iron profile but, no specific cause being detected. A total of 100 cases were found to be eligible for the study. Blood samples were collected for anti tissue transglutaminase IgA type antibodies detection. Patients with previous diagnosis of Celiac disease, history of depression, surgery within eight weeks and pregnant females were excluded from the study.

The filled in Performa was converted into database on SPSS version 14.0. Transglutaminase antibodies detected above range were calculated and their percentage was determined.

## RESULTS

A total of 100 patients with Iron deficiency anemia previously diagnosed on basis of serum levels were screened for the presence of Celiac disease via transglutaminase IgA type antibodies.

The average age of the patients was 37.12± 8.2years. Out of 100 patients 56(56%) were females and 44 (44%) were males with 1.27:1 female to male ratio. (Figure I)

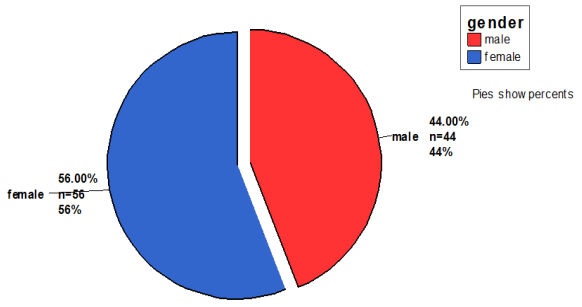


**Figure No.1: Gender distribution of patients n=100**

The average duration of Iron deficiency anemia was 32.14 ± 4.90 months which approximates roughly to 2.5 year.

Of these 100 patients with history of Iron deficiency anemia, Celiac disease was found via serology in 16 (16%) of the patients. (Figure 2) Among them 7(43.75%) were males and 9 (56.25%) were females with 1:1.28 male to female ratio.

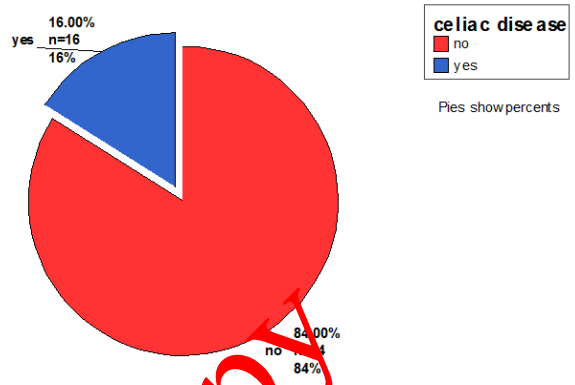


**Figure No.2: Frequency of celiac disease n=100**

Out of these 16 diagnosed cases of Celiac disease 7 (43.75%) have shorter duration of iron deficiency of anemia i.e. less than 30 month (2.5 year). (Table I)

**Table No.1: Celiac disease with duration of IDA**

| Duration of Iron deficiency Anemia | Celiac disease (Male) n=7 | Celiac Disease (Females) n=9 |
|---|---|---|
| 21 to 30 month | 3 (18.75%) | 4 (25.0%) |
| 31 to 40 month | 4 (25.0%) | 5 (31.25%) |

## DISCUSSION

Celiac disease was first described by Samuel Gee in 1888, in a report entitled "on the celiac affection", although a similar description was given by a Turkish scholar in second century. The cause of celiac disease was not clear until a Dutch pediatrician William K Dicke, described an association between the consumption of bread and cereal and recurrent diarrhea. The celiac lesion in the proximal small intestine was first described in 1954.15 Classically, celiac disease is a disease of infants but may see in later ages between 10-40 years. The primary finding includes mucosal inflammation, crypt hyperplasia and villous atrophy.[16,17] For many years, celiac disease was defined by a set of classic symptoms including malabsorption. But there are patients with atypical disease presenting with anemia, dental enemal defects, osteoporosis, arthritis, elevated transaminases, neurologic symptoms or infertility. Even few patients diagnosed incidentally upon screening for antibodies against gliden, and they do not exhibit any symptoms.[18]

Iron deficiency anemia is a known entity worldwide with prevalence of 2–5% among adult men and post-

menopausal women in the developed world.[19] Often it happens that of undiagnosed cases of IDA or refractory cases to iron therapy, studies have pointed out gluten sensitive enteropathy (Celiac Disease) as the culprit of iron deficiency anemia. Hershko C et al (2005) show presence of celiac disease in almost all cases of Iron deficiency anemia refractory to iron treatment.

Iron deficiency anemia is commonly present in patients with celiac disease and in one study reported to be the most frequent extra intestinal sign of atypical celiac disease with presentation up to 6% in adult.[7]

In other studies (Unsworth DJ et al 1999) [21] celiac disease was the cause of IDA up to 10% and (Corazza GR 1995)[22] up to 8.5% with unresponsiveness to oral iron therapy.

Physician often fail to consider Gluten Sensitive Enteropathy (GSE) as a cause of IDA when gastrointestinal symptoms are absent or nonspecific, where in GSE patients hemoglobin level have been inversely correlated with the severity of histological injury. Also patients who developed celiac disease or refractory iron therapy respond to gluten free diet for correction of anemia[23]

In our study we have only used serology for the diagnosis of celiac disease, however the high specificity of IgA endomysial (or TTG) may led to debate as to whether a positive result in the appropriate clinical setting can be considered diagnostic and eliminate the need for small bowel biopsy. It is recommended both IgA endomysial (or TTG) and small bowel biopsy prior to dietary treatment should be performed. This approach provides the best means of making a definitive diagnosis of celiac disease from the outset.

## CONCLUSION

In conclusion, celiac disease has a major burden on community due to its different presentations. To overcome these challenges, it is advisable to improve awareness not only among patients but also health professionals.

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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