Original Article

Celiac Disease

Frequency of Celiac Disease in Children with Iron Deficiency Anemia at the Children Hospital and The Institute of Child Health Multan

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ABSTRACT

Objective: To determine the frequency of celiac disease in patients presenting with iron deficiency anemia"

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at Department of Pediatric Gastroenterology, Children's Hospital & the Institute of Child Health; Multan lasted from December 2014 to October 2015.

Materials and Methods: Total one hundred patients were enrolled after fulfilling criteria. Non Probability consecutive sampling technique was used for sample collection. Patients were included in study fulfilling age one year to 14 years of both gender and diagnosed as iron deficiency anemia on serum ferritin level less than 15ng/ml.

Results: One hundred patients with iron deficiency anemia were enrolled in this study. The mean age of patients was 4.48±2.733. Fifty three(53%) male and forty seven (47%) were female. There was a significant difference between groups 1 and 2 in term of gender ($p<0.05$). The frequency of celiac disease was 21% in children with iron deficiency anemia.

Conclusion: Screening of celiac disease should be done as a routine investigation in children with iron-deficiency anemia.

Key Words: Celiac Disease (CD), Anti-Tissue Transglutaminase Antibody IgA (tTG-IgA), Iron Deficiency anemia (IDA)

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INTRODUCTION

Celiac disease is an immune mediated enteropathy due to gluten sensitivity characterized by damage of small intestine resulting in villous atrophy, hypertrophy of crypts and increased intraepithelial lymphocytosis.[1] It occur due to intake of precipitant such as gluten in genetically susceptible individuals. Celiac disease manifestations vary from age to age, ranging from typical gastrointestinal symptoms to atypical like short stature and anemia.[3] It may behave like an iceberg presenting as infertility and recurrent iron deficiency anemia. Celiac disease prevalence is about 1% in Europe and USA, but it is rare and/or under diagnosed in asia.[4] Celiac disease is about 1:310 in india.[5] Celiac disease is associated with HLA DQ2/DQ8 but only 4% develop celiac disease after introduction of gluten.[6]

Iron deficiency anemia in children is a public health problem worldwide.[7] Iron deficiency causes cognitive impairments such as attention span, intelligence and sensory perception functions but can affects emotions and behavior as well.[8] In European children prevalence of iron deficiency anemia is 2-6%.[8] Anemia in celiac disease occur due to deficiency of iron, vitamins, macronutrients and micronutrient.[9] Anemia can be presenting feature of celiac disease.[10]

In a study by Çekın et al., prevalence of celiac disease in iron deficiency anemia is 7.14%.[11] In another study by Ertekin et al., prevalence of celiac disease in iron deficiency anemia is 21.3%.[12]

The Children's Hospital and the Institute of Child Health Multan is a tertiary care center providing services to the children of south Punjab. Many children with persistent or recurrent iron deficiency anemia are referred to Gastroenterology / Hepatology unit for evaluation and management. This study will probe to determine the frequency of celiac disease in iron deficiency anemia. And because there is difference in the prevalence of celiac disease in iron deficiency anemia in different studies my study will help to know the prevalence of celiac disease in iron deficiency anemia in our population. This study will also pave the way for health care providers for early screening of celiac disease.

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MATERIALS AND METHODS

A case control study was conducted at department of pediatric Gastroenterology Children's Hospital & the Institute of Child Health; Multan lasted from December 2014 to October 2015. Total one hundred patients were enrolled in a study group.

Non Probability consecutive sampling technique was used for sample collection. Patients were included in study fulfilling age one year to 14 years of both gender and diagnosed as iron deficiency anemia on serum ferittin level less than 15ng/ml.

Patients were excluded with recurrent bleeding e.g. peptic ulcer, haemorrhoids, already on gluten free diet, with congenital malformations (down syndrome, malrotation of gut etc) and suffering from co-morbid conditions like chronic liver disease, renal diseases etc.

Study was started after taking permission from the institutional ethical committee. Anemic children were recruited in study from hematology OPD after fulfilling the inclusion and exclusion criteria. After explaining risks and benefits of study, written informed consent was taken from the parents/guardians. In anemic children Hemoglobin and serum ferittin level were checked from laboratory of Children's Hospital & the Institute of Child Health, Multan. Iron deficiency anemia was diagnosed when Hemoglobin less than 9 Gm% and serum ferritin level <15ng/ml. Then serum sample for anti tissue transglutaminase (tTG) IgA was sent. IgA anti-tTG assays by ELISA seem to be highly sensitive (90-98%) and specific (94-97%) for diagnosis of CD. Level >90u/ml was considered strong positive while level ranging from18-90u/ml,upper GI endoscopy was planned to confirm the celiac disease. Level less than 18 was considered negative for celiac disease. A Performa was designed consisting of Patient name, age, registration number, anti-tissue transglutaminase IgA level, biopsy result, hemoglobin level and serum Ferritin results. The outcome variable that is presence of celiac disease was noted in the order of frequency.

Data analysis: Data analyzed statistically using SPSS (statistical Package for social sciences) version 16. Outcome variables were exposed as mean + standard deviation). The Chi-square test was used for categorical variables. A P.value<0.05 was considered statistically significant.

RESULTS

One hundred patients with iron deficiency anemia were enrolled in this study. The mean age of patients was 4.48±2.733. Fifty three(53%) male and forty seven (47%) were female. There was a significant difference between groups 1 and 2 in term of gender (p<0.05). The frequency of celiac disease was 21% in children with iron deficiency anemia.

Table No. 1: Descriptive Statistics of Patients' age, serum ferritin Level and Anti Tissue Transglutaminase IgA

	Age of the Patients	Serum Ferritin Level	Anti Tissue Transglutaminase IGA
Mean	4.4895	8.4050	63.5813
Std. Deviation	2.73025	3.52785	162.51910
Range	11.10	14.00	843.80
Minimum	.90	1.00	20
Maximum	12.00	15.00	844.00

Table No. 2: Group wise frequency of Anti-t TG-IgA

Anti-tTGIGA	Frequency	Percent
< 18	79	79.0
18-90	4	4.0
90 >	17	17.0
Total	100	100.0

DISCUSSION

Celiac disease is a systemic disease, which is associated with a number of hematologic manifestations.[13] Individuals can present with hematological abnormalities even prior to the diagnosis of celiac disease. Anemia, especially IDA, is a frequent feature in CD and may be the only presenting symptom. Increased prevalence of CD has been found in patients with IDA.[14,15] An early identification of CD in patients with IDA has great importance, since a strict adherence to a gluten- free diet not only provides management of anemia but also prevents the severe complications such as ulcerative jejunoileitis, intestinal lymphoma and neoplasm.[16] Using a highly sensitive screening test (tTG antibody test) and duodenal histological examination, we confirmed that IDA may be the only presenting symptom of CD.

Celiac disease has a wide clinical spectrum including GI and extra-GI findings, which can be diagnosed at any age from childhood to the elderly. Classical or typical form of CD is associated with features of malabsorption; however, a substantial number of CD patients have atypical manifestations, including hematologic, endocrinologic, renal, neurologic, psychiatric, dermatologic, and cardiovascular symptoms.

This study shows the high prevalence of 21% in children with iron deficiency anemia while none was found positive in healthy children. In the literature, there are some studies in which the prevalence of CD was investigated in newly diagnosed IDA, with different results. Corazza et al. reported the prevalence of CD as 5%.[17] In another study by Çekın AH et al., prevalence of celiac disease in iron deficiency anemia is 7.14%.[11] In study of Ertekin et al., prevalence of celiac disease in iron deficiency anemia is 21.3% that is very

close to our study.[12] Ayhan Gazi Kalayci et al[18] reported 4.4% while Umaprasanna S.et al[19] found occult celiac disease as 2.8%.

The study does have certain short comings; the study has been conducted on a smaller number of patients. In order to achieve validity, more prospectively designed, multi center involvement, larger sample sizes are required to know the exact prevalence of celiac disease in this part of the world.

CONCLUSION

Screening of celiac disease should be done as a routine investigation in children with iron-deficiency anemia. Biopsy may be suggested in patients with iron-deficiency anemia who have positive celiac disease serology.

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

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